

Cicerone® Certification Program

UK Certified Beer Server Syllabus

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This syllabus outlines the knowledge required of those preparing for the Certified Beer Server exam in the United Kingdom (for syllabi pertaining to other regions, visit cicerone.org). While this list is comprehensive in its scope of content, further study beyond the syllabus is necessary to fully understand each topic. The content tested on the Certified Beer Server exam is a subset of the information presented within the Master Cicerone® syllabus, and individual syllabi for all four levels of the program may be found on the cicerone.org website.

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Full Syllabus

I. Keeping and Serving Beer

- A. Serving alcohol
 1. Alcohol's effects
 - a. Absorption and elimination
 - b. Physical and behavioural indicators
 2. Responsible serving practices
 - a. Provide accurate ABV information to consumers at point of dispense
 - b. Select appropriate serving size based on ABV
- B. Beer storage
 1. Beer is best consumed fresh
 - a. Certain types of beers may age in ways that make them interesting to drink months or years later if properly cellared, but the majority of beer should be consumed fresh
 2. Rotate inventory
 - a. Check date codes regularly
 - i. Meaning of code
 - Some date codes indicate the best-by date
 - All beer packages in the UK are required to have a clearly stated best-before date
 - Some date codes indicate the bottling/packaging date
 - Some brands will include a bottling/packaging date in addition to the best-by date
 - ii. Types of codes (order and number of digits may vary)
 - Traditional consumer date codes (e.g., 150612 = 15 June 2012)
 - Julian/ordinal date codes (364-14 = 30 December 2014)
 - Some breweries have their own proprietary date code format
 - b. Ensure that beer is consumed in the order of dating
 - c. Remove out of date products from service inventory
 - d. General freshness guidelines
 - i. Keg beer
 - Non-pasteurised keg beer can remain fresh for about 45–60 days (refrigerated)
 - Pasteurised keg beer can remain fresh for about 90–120 days (refrigerated)
 - When not refrigerated or subjected to other stresses, shelf life decreases significantly
 - ii. Bottled/canned beer
 - If kept refrigerated, can remain fresh for up to 6 months
 - Hoppy styles like IPA are more susceptible to the effects of time, and may show flavour changes in as little as 3 months, even when refrigerated
 - When not refrigerated or if subjected to other stresses, may be noticeably off after 3 months
 - Taste aged product against fresh product to determine deterioration
 - e. Train staff to promote and sell all beers offered

3. Store beer properly
 - a. Refrigerated storage is best for all beers at all times, excepting cask beer
 - i. If refrigeration is not available, all beer should go into the beer cellar or other temperature-controlled storage
 - ii. If beer is not refrigerated, keep inventories small and sell the beer quickly
 - b. Cask ales must be stored in a temperature-controlled environment which is kept at 11–13° C, typically the beer cellar
 - c. Non-refrigerated storage accelerates aging and development of off flavours
 - i. With time, all beers will develop signs of oxidation (diminished hop flavour and aroma; malt shift towards honey, caramel, toffee, etc.; papery and wet cardboard flavours)
 - d. Temperature changes within a reasonable range (e.g., moving beer from cold storage (3 °C) to room temperature storage (20–25 °C) or vice versa) are not inherently damaging to a beer's flavour, though the beer will remain fresh for longer if stored at cold temperatures at all times
 - e. Beer should not be allowed to reach temperatures in excess of 25 °C as these conditions lead to rapid flavour degradation
 - f. The beer cellar should be regularly cleaned and maintained to prevent development of off flavours, particularly in cask beer
 4. Protect beer from light
 - a. Skunky flavour (also known as lightstruck flavour) is caused by sunlight, fluorescent light, and most LED lights and is most noticeable in the aroma of the beer
 - b. Skunking may be evident after just a couple minutes of light exposure
 - c. Bottled beers are subject to skunking
 - i. Brown glass blocks most of the wavelengths of light that cause skunking, and therefore offers superior protection to clear and green glass
 - ii. Green glass blocks very little of the light that causes skunking
 - iii. Clear glass offers no protection against skunking
 - d. Cans, ceramic bottles, and bottles in closed case boxes that completely shield beer from light give maximum protection from skunking
 5. Serve beer properly
 - a. Draught beer must be served using CO₂ or a CO₂-nitrogen mix at the proper pressure setting as specified by the brewer/brand owner
 - b. Compressed air should never be used to pressurise traditional kegs in which the dispense gas comes into contact with the beer
- C. Draught systems
1. Key elements
 - a. Keg
 - b. Cask
 - c. Coupler
 - d. Foam on Beer monitor/detector (FOB)
 - e. Beer tap
 - i. The nozzle for a nitro (stout) tap is different than the nozzle for an ale tap
 2. Draught system operation

- a. Standard cellar temperature of 11–13 °C¹
 - i. Cask ales are typically dispensed at cellar temperature
 - ii. Keg beer is cooled by a flash chiller in the cellar to 5–8 °C
 - b. All kegs should be in the beer cellar for at least 24 hours prior to service to prevent foaming
 - c. Gas pressure applied to keg should only be set or adjusted by a draught-trained professional
3. Basic troubleshooting
 - a. Beer has been in the beer cellar for at least 24 hours prior to service
 - b. Coupler is properly engaged
 - c. No kinks or pinches in hose from coupler to wall
 - d. FOB, if present, is properly set for service
 - e. If beer is still pouring badly, contact a draught-trained professional for assistance
 4. Draught system maintenance
 - a. Draught systems need to be cleaned regularly to prevent development of off flavours in beer and to ensure proper operation of the draught system
 - b. Draught line cleaning is required every 7 days or less
 - c. Due to the hazardous nature of cleaning solutions, never attempt to pour beer prior to full completion of draught system cleaning
- D. Beer glassware
1. Select appropriate glassware
 - a. Size
 - i. UK glasses are sized at 1/3, 1/2, 2/3, or full pint
 - In most cases the glass is intended to be filled to the rim to achieve the proper volume
 - Occasionally lined glasses may be seen, which should be filled with liquid beer up to the line and foam head from the line to the top of the glass
 - ii. Higher alcohol beers should be served in smaller glasses
 - b. Shape
 - i. Cultural and historical traditions connect certain glasses to specific styles
 - c. Brand
 - i. Branded glasses matched to beer
 2. Use “beer clean” glassware
 - a. Each glass must be cleaned before refilling. Do not refill a used glass
 - b. Glass washing procedure after each use
 - i. Empty the glass into sink
 - ii. A brush bowl or finger sponge (i.e., a Quash®) charged with non-foaming glass detergent should be used to remove lipstick and other visible deposits from rim
 - iii. Wash in glass washing machine
 - Place glass upside down on the rack of the washer
 - Run the wash cycle according to the manufacturer’s instructions
 - After washing, dry glass inverted on a rack so air circulates inside
 - iv. Glass washing machine considerations

¹ “Profit Through Quality” Edition 7, June 2013. BIIAB p 54.

- Use a machine dedicated to beer glassware ONLY. Do not use this machine to clean dishes or glassware with food or dairy residue (e.g., coffee mugs with cream or milk added, cocktails incorporating egg whites or cream, etc.)
 - Fats from food or dairy will coat other glassware in the washer resulting in dirty glasses and poor head retention
 - Use correct detergent and rinse aid—follow manufacturer’s recommendations
 - Wash cycle must use water at a minimum temperature of 55 °C. Higher temperatures may be recommended
 - Rinse cycle must use water at a minimum temperature of 65 °C. Higher temperatures may be recommended
 - Maintain washer to assure proper water flow through each nozzle and washer arm
 - Regularly service machine following manufacturer's guidelines to ensure proper operation
 - Periodically check the interior of the glass washer to be sure that it is free of mould and debris
- c. Renovate glasses as needed
- i. Rinse aid, minerals, and protein can build up on glasses after repeated washing
 - ii. Cleaning with a special “renovate” detergent can return them to ideal condition. Follow manufacturer’s recommendations
- d. How to check that glass is beer clean
- i. Without beer
 - Sheeting (wet glass interior and then empty glass; water should sheet off of glass evenly; formation of droplets (rain on the window) or webbing indicates that the glass is not beer clean) (a.k.a. “Waterbreak”)
 - Salt test (wet glass interior, empty glass and then sprinkle salt throughout; places where salt does **not** adhere are not beer clean)
 - ii. With beer
 - Head size, shape, retention—good head formation and retention are signs of a beer clean glass
 - Bubbles clinging to the sides of the glass (in liquid beer) indicate that the glass is **not** beer clean
 - During consumption, a bit of foam (sometimes called “lace”) will cling to the side of a beer clean glass following each sip
3. Glass temperature
- a. Glasses should not be warm to the touch when filled
 - b. Room temperature and chilled glasses are acceptable
 - c. Frozen/frosted glasses are not recommended—they cause foaming and they make beer too cold
- E. Serving bottled beer
- 1. Prepare for service
 - a. Bottle-conditioned beer should be stored upright prior to service

- i. Bottle-conditioned beer is carbonated by yeast in the package, and consequently contains some amount of sediment
 - b. All bottled beer should be stored in refrigerator at least 8 hours prior to service
 - c. Service temperature for bottled beer is 4 to 6 °C, though some bottle-conditioned beers may be served a bit warmer
 2. Examine bottle
 - a. Look for white flakes (snow-like), which can indicate old, unstable beer. Do not serve beer in this condition
 - b. Look for a thin ring of residue at liquid level in the neck of the bottle, which is generally indicative of a bad bottle if present. Do not serve beer in this condition
 - c. Check for yeast on the bottom of the bottle
 - i. Retain yeast in bottle unless:
 - Consumer requests yeast to be poured
 - Style (e.g., Weissbier) is often poured with yeast
 - ii. To pour yeast, rouse by swirling, rolling, or inverting
 3. Open bottle
 - a. Twist-off crown
 - i. Twist off by hand
 - ii. Napkin may be used to aid grip and protect hand
 - b. Pry-off crown
 - i. Prefer openers with a bar or other lift area at least 0.25 in (0.5 cm) wide to prevent the possibility of breaking the bottle during opening
 - ii. Lift in one motion
 - c. Mushroom cork
 - i. Practice cork safety—keep bottle pointed away from consumer at all times
 - ii. Remove wire cage by untwisting the tab
 - iii. Hold thumb over cork at all times once cage has been removed
 - iv. Grip the cork in one hand (a napkin may be used to aid your grip) and the bottle in the other. Remove cork by twisting the bottle to loosen the cork
 - v. When removing the cork, do so slowly and gently so as not to disturb sediment and make the beer volatile
 - d. Crown plus cork
 - i. Practice cork safety—keep bottle pointed away from consumer at all times
 - ii. Lift crown as described in I.E.3.b
 - iii. Corkscrew will be required after removing crown
 - iv. Place the tip of the corkscrew on the centre of the cork and turn clockwise to drive the corkscrew into the cork
 - v. When removing the cork, do so slowly and gently so as not to disturb sediment and make the beer volatile
 - e. Wax-dipped crown
 - i. Use a paring knife or the blade of a wine key to cut out a small notch of wax directly below the crown to allow a bar key to reach under the crown
 - ii. Use a bar key to pry the crown off of the bottle, being careful to ensure that no flakes of wax fall into the bottle
 - iii. Use a clean bar towel to wipe any wax debris from the lip of the bottle
 4. Final bottle check

- a. Check bottle lip—do not serve beer from bottles with broken or damaged lips
 - b. Also examine bottle lip for rust, dried beer, or yeast that could affect flavour or appearance of the beer
 - c. If the bottle has a cork, retain and present it to the consumer
 - i. In the case of a rare, unusual, or new beer, the crown should be retained to present to the consumer
5. Pouring bottled beer
- a. Filtered beer
 - i. Beers bottled without yeast or other sediment—the entire contents of the bottle can be poured into the glass
 - ii. Hold the glass at a 45-degree angle and pour down the side of the glass until the glass is 2/3 full
 - iii. Gently tilt the glass upright and pour down the middle to create approximately 1 inch (2.5 cm) of foam head on the beer as the pour finishes. German wheat beers and Belgian ales should traditionally have 2–3 in (5–8 cm) of head
 - b. Unfiltered beers
 - i. Some beers are packaged unfiltered or with yeast in the bottle. In most cases, yeast and sediment should be retained in the bottle
 - ii. Throughout the pour, be careful not to disturb the sediment
 - iii. Hold the glass at a 45-degree angle and pour down the side of the glass until the glass is 2/3 full
 - iv. Gently tilt the glass upright and pour down the middle to create an appropriate amount of foam for the style being served
 - v. While finishing the pour, watch the neck of the bottle and be prepared to stop pouring when the yeast moves toward the top of the bottle
 - vi. When in doubt about whether to include the yeast, ask the consumer their preference
- F. Serving draught beer
1. Pouring a draught lager or keg ale
 - a. **Never** put the tap in contact with the glass
 - b. **Do not** allow the tap to become immersed in the beer or foam in the glass
 - c. Hold the glass at a 45-degree angle, 1 inch (2.5 cm) below the tap
 - d. Grip the tap handle near the base and pull forward to the fully open position to start the flow of beer
 - i. When a tap is only open partially, beer will pour foamy
 - e. Pour down the side of the glass until the glass is 2/3 full
 - f. While continuing to pour, gently tilt the glass upright and pour down the middle to create an appropriate amount of head on the beer as the pour finishes
 - i. The head on a draught lager or keg ale should be no more than 0.4 in (1 cm)
 - ii. Beer served in lined glasses must have liquid up to the line
 - iii. In non-lined glasses, 95% of the glass' contents must be liquid
 - g. Close the tap as the foam cap reaches the top of the glass to prevent beer waste
 - h. If a customer requests a top up, they must be accommodated
 2. Pouring nitro stout
 - a. **Never** put the tap in contact with the glass or allow it to become immersed in the beer or foam in the glass

- b. Hold the glass at a 45-degree angle, 1 inch (2.5 cm) below the tap
 - c. Pull the tap handle forward to the fully open position to start the flow of beer
 - d. Pour down the side of the glass until the glass is three-quarters full
 - e. Allow the beer to settle for 1–2 minutes, and then pour down the middle to create an appropriate amount of head on the beer as the pour finishes
 - i. The head on a nitro stout should be no more than 0.4 in (1 cm)
 - f. If a customer requests a top up, they must be accommodated
3. Changing a keg (same product)
- a. For many coupler designs²:
 - i. Grip keg coupler handle, then pull out (some coupler models instead require a button on the underside to be depressed) and raise the handle to the “up” or “off” position to disengage. Turn the coupler a quarter turn (90 degrees) anticlockwise to unseat. Lift off of the keg
 - ii. Seat the coupler on a new keg. Turn clockwise a quarter turn (90 degrees) to lock the coupler in place, then lower the coupler handle to the “down” or “on” position to engage
 - b. For slider-type system couplers³:
 - i. Grip keg coupler handle, then pull out (some coupler varieties instead require a button on the underside to be depressed) and raise the handle to the “up” or “off” position to disengage. Slide the coupler off of the keg valve
 - ii. Slide the coupler on to the keg valve of a new keg. Lower the coupler handle to the “down” or “on” position to engage
 - c. In systems that use them, the foam on beer monitor (FOB) for the keg needs to be reset after a keg change. This is done by venting the FOB mechanism to release foam and gas from the chamber and filling with beer.
- G. Cask-conditioned ale
1. Definition of real ale (CAMRA)
 2. Cask service components
 - a. Cask
 - b. Tap
 - c. Soft and hard spiles/pegs
 - d. Keystone
 - e. Shive
 - f. Sparkler
 3. Cask ale service
 - a. Gravity dispense
 - b. Beer engine
 - i. Short spout
 - **Never** put the tap in contact with the glass or allow it to become immersed in the beer or foam in the glass
 - Hold the glass at a 45-degree angle, 1 inch (2.5 cm) below the tap

² The procedure described is used to change kegs with D-, G-, S-, and U-system couplers. Certified Beer Server candidates do not need detailed knowledge of each coupler system but must understand the basic steps to change a keg.

³ The procedure described is used to change kegs with A- and M-system couplers.

- Pull the handle smoothly and steadily. Straighten the glass gradually as it fills to create an appropriate amount of head on the beer as the pour finishes
 - The head on a cask ale should be no more than 0.4 in (1 cm)
 - ii. Swan neck with sparkler
 - Hold clean glass vertically with sparkler positioned against the bottom of the glass
 - Pull the handle smoothly and steadily. Gradually lower the glass as it fills, but always keep the sparkler below the foam, immersed in the liquid beer
 - Allow to settle. To top up, place the nozzle below the foam, in the liquid beer.
 - The head on a cask ale should be no more than 0.4 in (1 cm)
 - Since the swan neck is immersed in the beer during the pour, regularly wipe down the swan neck with a clean, micro-fibre, lint-free cloth
 - iii. Impact of sparkler use
4. Cask Ale Essentials
- a. Cloudy beer should not be served
 - b. At the start of service, hard spiles must be removed from each cask to be served. At the end of service, hard spiles must be replaced in each cask that was on service
 - i. Instead of using a hard spile, in some modern cask ale service systems a vent valve may be opened at the start of service and closed at the end of service
 - ii. Some pubs will leave a soft spile loosely placed in the shive during service, but this can contribute to difficulty in pulling beer through the engine
 - c. Consult the cellar manager before tilting casks or making any other adjustments or modifications to the setup

II. Beer Styles

A. Understanding beer styles

- 1. Historical development of beer styles
 - a. First driven by available ingredients, equipment, and water
 - b. Shaped by technology, taxes and regulations, culture, consumer appeal, etc.

B. Style parameters

- 1. Quantitative parameters of beer character
 - a. Alcohol by volume (ABV)
 - b. International Bitterness Units (IBUs)
 - c. EBC Colour⁴
- 2. Qualitative parameters of beer character
 - a. Appearance
 - b. Aroma
 - c. Flavour
 - d. Finish/Aftertaste

⁴ EBC Colour is the colour method of the European Brewery Convention, while SRM is the method established by the American Society of Brewing Chemists. This syllabus outlines beer styles catalogued by the Beer Judge Certification Program (BJCP), which uses SRM value in its style descriptions. Certified Beer Server candidates are not responsible for knowing specific numerical ranges for beer colour.

- e. Mouthfeel
 - f. Perceived bitterness
- C. Beer style knowledge
- 1. Knowledge requirements of styles listed in this section
 - a. Qualitative knowledge of perceived bitterness using the following descriptors: low, moderate, pronounced, assertive, or highly assertive⁵
 - b. Qualitative knowledge of colour using the following descriptors: straw, gold, amber, brown, or black
 - c. Qualitative knowledge of alcohol content using the following descriptors⁶: lower, normal, elevated, high, or very high⁷
 - d. Qualitative knowledge of key flavours
 - 2. Beer styles by region⁸
 - a. Belgium and France
 - i. Lambic beers
 - Gueuze (PB – Low; C – Light gold to gold; ABV – Normal to elevated)
 - Fruit Lambic (Kriek, Framboise, etc.) (PB – Low; C – Varies with fruit; ABV – Normal to elevated)
 - ii. Flanders ales
 - Flanders Red Ale (PB – Low; C – Red-brown; ABV – Normal to elevated)
 - iii. Trappist and abbey ales
 - Belgian Dubbel (PB – Low; C – Light amber to dark amber; ABV – Elevated)
 - Belgian Tripel (PB – Moderate; C – Light gold to gold; ABV – High)
 - iv. Pale Belgian beers
 - Belgian Blond Ale (PB – Low; C – Light gold to gold; ABV – Elevated)
 - Belgian Golden Strong Ale (PB – Moderate; C – Straw to gold; ABV – High to very high)
 - v. Unique beers
 - Saison⁹ (PB – Moderate; C – Light gold to amber; ABV – Normal to elevated)
 - Witbier (PB – Low; C – Straw to light gold, made white by haze; ABV – Normal)
 - b. Britain and Ireland
 - i. England
 - Pale ales
 - Ordinary Bitter (PB – Pronounced; C – Gold to amber; ABV – Lower)

⁵ Test questions will reference IBUs as catalogued by the 2021 BJCP guidelines in addition to perceived bitterness levels as presented in the Certified Beer Server Syllabus

⁶ Alcohol level descriptors correspond to the following ABV ranges: Lower – <4.5%; Normal – 4.5–6.0%; Elevated – 6.1–7.5%; High – 7.6–10.0%; Very high – >10.0%

⁷ Test questions will reference ABV values as catalogued by the 2021 BJCP guidelines in addition to alcohol level descriptors as presented in the Certified Beer Server Syllabus

⁸ Key for style descriptors: PB – Perceived Bitterness; C – Colour; ABV – Alcohol level

⁹ Variations in strength (table, standard, super) and colour (pale, dark) exist – candidates are tested on the standard-strength, pale variety

- Best Bitter (PB – Pronounced; C – Gold to amber; ABV – Lower to normal)
- Strong Bitter (PB – Pronounced; C – Gold to dark amber; ABV – Normal)
- British Golden Ale (PB – Pronounced; C – Straw to gold; ABV – Lower to normal)
- English IPA (PB – Assertive; C – Gold to amber; ABV – Normal to elevated)
- Dark ales
 - British Brown Ale (PB – Moderate; C – Amber to brown; ABV – Lower to normal)
 - Sweet Stout (PB – Low to moderate; C – Dark brown to black; ABV – Lower to normal)
 - Oatmeal Stout (PB – Moderate; C – Brown to black; ABV – Lower to normal)
- ii. Scotland
 - Scottish Export (PB – Moderate; C – Amber to brown; ABV – Lower to normal)
 - Wee Heavy (PB – Low; C – Amber to brown; ABV – Elevated to high)
- iii. Ireland
 - Irish Stout (PB – Pronounced; C – Brown to black; ABV – Lower to normal)
- c. Germany, Czech Republic, and Austria
 - i. Lagers
 - Pale
 - German Pils (PB – Pronounced; C – Straw to light gold; ABV – Normal)
 - Munich Helles (PB – Moderate; C – Straw to light gold; ABV – Normal)
 - Czech Premium Pale Lager (PB – Pronounced; C – Straw to Gold; ABV – Lower to normal)
 - Amber or dark
 - Märzen (PB – Low; C – Gold to dark amber; ABV – Normal to elevated)
 - Bocks
 - Helles Bock (PB – Moderate; C – Gold to light amber; ABV – Elevated)
 - Doppelbock (PB – Low; C – Gold to brown; ABV – Elevated to high)
 - ii. Ales
 - Wheat beers
 - Weissbier (PB – Low; C – Straw to gold; ABV – Normal)
 - Berliner Weisse (PB – Low; C – Straw; ABV – Lower)
 - Gose (PB – Low; C – Straw to light gold; ABV – Lower to normal)
 - Rhine Valley ales
 - Kölsch (PB – Moderate; C – Straw to light gold; ABV – Normal)
- d. United States

- i. Pale lagers
 - American Light Lager (PB – Low; C – Straw; ABV – Lower)
- ii. Pale ales
 - American Wheat Beer (PB – Moderate; C – Straw to gold; ABV – Lower to normal)
 - American Blonde Ale (PB – Moderate; C – Straw to gold; ABV – Lower to normal)
 - American Pale Ale (PB – Pronounced; C – Light gold to light amber; ABV – Normal)
 - American Amber Ale (PB – Pronounced; C – Light amber to dark amber; ABV – Normal)
- iii. IPAs
 - American IPA (PB – Assertive; C – Gold to amber; ABV – Normal to elevated)
 - Double IPA (PB – Highly assertive; C – Gold to amber; ABV – High)
 - Hazy IPA (PB – Pronounced; C – Straw to gold, often with significant haze; ABV – Elevated to high)
- iv. Dark ales
 - American Brown Ale (PB – Moderate; C – Dark amber to black; ABV – Normal)
 - American Porter (PB – Pronounced; C – Brown to black; ABV – Normal to elevated)
 - American Stout (PB – Assertive; C – Dark brown to black; ABV – Normal to elevated)
 - Imperial Stout (PB – Pronounced; C – Dark brown to black; ABV – High to very high)
- v. Strong ales
 - American Barleywine (PB – Pronounced; C – Light amber to light brown; ABV – High to very high)
- e. Other regions
 - i. International
 - International Pale Lager (PB – Moderate; C – Straw to gold; ABV – Normal)
- a. Emerging Styles
 - i. Pastry Stout or Dessert Stout
 - A dark beer that uses culinary ingredients like marshmallow, vanilla, chocolate, coffee, fruits, nuts, or spices to create a flavour profile that mimics desserts, pastries, or candies
 - (PB – Low to moderate; C – Dark brown to black; ABV – Elevated to very high)
 - ii. American-Style Fruited Sour
 - A sour beer produced with fruit, fruit extracts, or flavourings that provide harmonious fruit flavour ranging from subtle to intense.
 - Should be free of wood-aged flavours, as well as funky, wild flavours from other yeast and bacteria
 - (PB – Low; C – Varies with fruit; ABV – Varies)

- b. Low-alcohol (NoLo Beer) and Alcohol-free beer
 - i. Any style can be made NoLo or Alcohol-free
 - There are several methods used to produce NoLo or Alcohol-free beer
 - ii. The UK regulates what is recognized as Low-Alcohol or Alcohol-free beer
- c. Gluten-free beer
 - i. Gluten is a protein commonly found in cereal grains including barley and wheat
 - ii. Commonly used gluten-free grains
 - Sorghum
 - Millet
 - Rice
 - Corn
 - Buckwheat
 - Quinoa
 - iii. Any style can be made gluten-free or gluten-reduced
 - iv. Gluten-free vs Gluten-reduced
 - Gluten-free beers are made entirely with gluten-free grains
 - Gluten-reduced
 - Gluten-reduced beers can be made with grains that contain gluten or with a combination of gluten-free and gluten-containing grains
 - a. The beer is then processed to break down or reduce the amount of gluten present
 - b. Local regulations dictate the allowable level of gluten
 - c. In the UK, it must contain less than 20 ppm of gluten

III. Beer Flavour and Evaluation

A. Taste and flavour

1. How we perceive flavour

- a. Aroma
- b. Taste
 - i. Established
 - Sweet
 - Salty
 - Sour
 - Bitter
 - Umami
 - ii. Emerging
 - Fat
- c. Mouthfeel
 - i. Body
 - ii. Carbonation

2. Beer evaluation

- a. Temperature
 - i. Beer reveals more flavour as its temperature increases and should be served between 3 and 13 °C depending upon its style
- b. Components of evaluation

- i. Appearance
 - ii. Aroma
 - iii. Taste
 - iv. Mouthfeel
 - v. Finish/Aftertaste
 - c. Key evaluation techniques
 - i. Aroma techniques
 - Distant Sniff: Swirl beer while holding glass 6–8 in (15–20 cm) away from nose and take one to two short sniffs
 - Drive-by Sniff: Swirl beer; slowly pass glass across your face, underneath your nose; take a few short sniffs as the glass passes by
 - Short Sniff: Swirl beer; bring glass to nose and take one to two short sniffs
 - Long Sniff: Swirl beer; bring glass to nose and take one long sniff
 - Covered Sniff: Cover glass with hand; swirl beer for 3 to 5 seconds; bring glass to nose, remove hand, and sniff
 - ii. Use a consistent background to assess the colour and clarity of the beer
 - iii. Beer should reach all parts of the tongue during tasting
 - iv. Flavour perception continues after swallowing
- B. Identify normal flavours of beer and their source
 1. Malt and grain flavours
 - a. Pale beer: Uncooked flour, bread dough
 - b. Golden beer: White bread, wheat bread, water cracker
 - c. Light amber beer: Bread crust, biscuit, graham cracker
 - d. Amber beer: Toast, caramel, pie crust
 - e. Brown beer: Nutty, toffee, chocolate, dark/dried fruit
 - f. Black beer: Roast, burnt, coffee
 2. Hop flavours
 - a. Bitterness, flavour, and aroma effects
 - b. Traditional regional hop traits
 - i. American: Piney, citrus, resinous, tropical fruit, catty, onion/garlic
 - ii. English: Earthy, herbal, woody
 - iii. German/Czech: Floral, perfumy, peppery, minty
 3. Fermentation flavours
 - a. Ale versus lager flavours (See Ingredients section IV.A.3.a)
 - b. Weizen yeast flavour
 - c. Other yeast and bacteria can contribute to beer flavour
- C. Off-flavour knowledge
 1. Oxidation
 - a. Diminished hop flavour and aroma
 - b. Malt shift towards honey, caramel, toffee, etc.
 - c. Papery/wet cardboard
 - d. Waxy/lipstick
 2. Light struck
 3. Dirty draught lines
 - a. Buttery
 - b. Sour

IV. Beer Ingredients and Brewing Processes

A. Ingredients

1. Grains
 - a. Malt
 - i. Malt is produced by sprouting and drying cereal grains such as barley or wheat
 - ii. Different shades and flavours of malt are produced by variations in kilning
 - b. Unmalted grains such as corn or rice are sometimes used in beermaking
2. Hops
 - a. Hop character in beer
 - i. Depending on use, hops can contribute bitterness, flavour, and/or aroma
 - ii. Aroma and flavour vary with variety
 - v. Dry hopping
 - Process of adding hops after the wort is chilled, typically in the fermenter, conditioning tank or serving vessel
 - The primary goal is to increase hop flavour and aroma, not to add bitterness
 - A brewer may repeat the dry hopping process multiple times for added effect
 - a. Often indicated with terms like Double Dry Hopping (DDH) or Triple Dry Hopping (TDH)
 - b. Basic anatomy of hop plant and cone
 - c. Major growing regions
 - i. Germany
 - ii. Czech Republic
 - iii. Britain
 - iv. United States
 - v. Australia
 - vi. New Zealand
3. Yeast
 - a. Taxonomy
 - i. Ale yeast
 - *Saccharomyces cerevisiae*
 - Generally produce esters in levels which give fruity flavours to finished beers
 - Some strains possess a certain gene which results in production of phenolic flavours such as clove, nutmeg, white pepper
 - ii. Lager yeast
 - *Saccharomyces pastorianus* also known as *Saccharomyces carlsbergensis*
 - Generally do not produce esters or phenols in appreciable quantities, resulting in a focus on malt and hop character
 - b. Other yeast and bacteria can contribute to beer flavour
4. Water
 - a. Water makes up 90+% of the weight of beer
 - b. All water contains traces of minerals

- i. Many are essential to beer production
 - ii. Several have desirable flavour impacts
 - iii. Some have undesirable flavour impacts
 - c. Modern brewers adjust water chemistry to fit the requirements of the beer they brew
- B. Brewing Process Overview
 - 1. Milling
 - a. The act of physically crushing or grinding malt and other grains in a mill, producing grist
 - 2. Mashing
 - a. Grist is mixed with hot water
 - b. Enzymes in the malt break down starches into sugars
 - 3. Lautering
 - a. The sweet liquid, called wort, is separated from the spent grains
 - i. Sugars, colour, and flavour compounds are extracted
 - 4. Boiling
 - a. Wort is boiled in the brew kettle
 - i. Hops are added to impart bitterness, flavour, and aroma
 - ii. Wort is sterilized
 - 5. Whirlpool
 - a. Wort is spun to separate hop fragments and solid particles from the hot wort
 - 6. Chilling
 - a. Wort is cooled to fermentation temperature
 - 7. Fermentation
 - a. Yeast is pitched into the cooled wort
 - b. Yeast then consumes sugars, creating:
 - i. Alcohol
 - ii. CO₂
 - iii. Flavour compounds
 - 8. Maturation/Lagering
 - a. Immature beer is rested to promote the removal of undesirable flavours
 - 9. Clarification
 - a. Separation of yeast and other solids from the beer using a variety of methods
 - 10. Carbonation
 - a. CO₂ levels in the beer are adjusted to desired level
 - 11. Packaging
 - a. Cans
 - b. Bottles
 - c. Kegs

V. Pairing Beer with Food

No single model perfectly explains all the dynamics of beer and food pairing. Candidates at this level should understand that beer and food work well together, but do not need to possess knowledge of specific beer and food interactions.