

# Cicerone® Certification Program

## UK Certified Cicerone® Syllabus

Updated 20 November 2017

This syllabus outlines the knowledge required of those preparing for the Certified Cicerone® exam in the United Kingdom. While this list is comprehensive in its scope of content, further study beyond the syllabus is necessary to fully understand each topic. Additional syllabi for other levels of the program can be found at [cicerone.org](http://cicerone.org).

### Outline

(Full syllabus begins on next page.)

#### I. Keeping and Serving Beer

- A. Purchasing and accepting beer
- B. Serving alcohol
- C. Beer storage
- D. Draught principles
- E. On-premises draught equipment and maintenance
- F. Beer glassware
- G. Serving bottled beer
- H. Serving draught beer
- I. Cask-conditioned ale

#### II. Beer Styles

- A. Understanding beer styles
- B. Style parameters
- C. History, characteristics, and flavour attributes of styles by region

#### III. Beer Flavour and Evaluation

- A. Taste and flavour
- B. Identify normal flavours of beer and their source
- C. Identify common beer off flavours by name and source
- D. Tasting examination

#### IV. Beer Ingredients and Brewing Processes

- A. Ingredients
- B. Processes

#### V. Pairing Beer with Food

- A. Possible outcomes of successful beer and food pairings
- B. Beer and food vocabulary
- C. Pairing concepts
- D. Common beer and food interactions
- E. Creating a pairing
- F. Designing a meal
- G. Classic beer and food pairings
- H. Cooking with beer

#### VI. Additional Sources

## Full Syllabus

### I. Keeping and Serving Beer

- A. Purchasing and accepting beer
  1. Assessing beer shipment: physical condition and age
    - a. Product Freshness
      - i. All beer packages in the UK are required to have a clearly stated best before date
      - ii. Check to ensure there is adequate time to sell the product before expiration
    - b. Physical condition of container
      - i. Not dented or broken
      - ii. No signs of leakage or box weakness
- B. 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
- C. Beer storage
  1. Beer is best consumed fresh
    - a. A very few strong or intensely flavoured beers may age in ways that make them interesting to drink months or years later if properly cellared
  2. Rotate inventory
    - a. Ensure that beer is consumed in the order of dating
    - b. Remove out of date products from service inventory
    - c. Train staff to encourage/sell/promote all beers offered
  3. Store beer properly
    - a. Ideally, all beer should go into the beer cellar or other temperature-controlled storage
    - b. Cask ales must be stored in controlled temperature environment which is kept at 11-13° C, typically the beer cellar
    - c. Non-refrigerated storage accelerates aging and development of off flavours
      - With time, all beers will develop signs of oxidation (papery, wet cardboard flavours)
      - Possible autolysis of yeast when present as a deposit (meaty)
      - Possible development of microbial off flavours (sour, buttery, phenolic, other)
    - d. Cellar should be regularly cleaned and maintained to prevent development of off flavours, particularly in cask beer
    - e. Clear and green bottle beers are subject to becoming light struck
      - Caused by sunlight or fluorescent light
      - Most noticeable in the aroma of the beer
      - Brown glass blocks 98% of the wavelengths of light that cause this, and therefore offers superior protection to clear and green glass
      - Green and clear glass offer little or no protection against this

- Light struck aroma may be evident after a few minutes of light exposure
  - Cans, ceramic bottles, and bottles in closed case boxes that completely shield beer from light give maximum protection
4. Serve beer properly
    - a. Draught beer must be served using CO<sub>2</sub> or a CO<sub>2</sub>-nitrogen mix at the proper pressure setting as specified by the brewer/brand owner
    - b. Compressed air should never be used to pressurize traditional kegs
    - c. Bag-in-box or “KeyKeg” style kegs that separate the applied gas from the beer with a flexible plastic barrier can be pressurized with compressed air
- D. Draught principles
1. CO<sub>2</sub> pressure is applied to maintain carbonation of the beer during dispense
    - a. Each beer is carbonated to a specific value. Brewer or brand owner provides this information to retailer
    - b. Temperature, pressure, gas blend combination must match this specification
  2. Movement of beer to tap must overcome system resistance from:
    - a. Friction in lines
    - b. Change in elevation
    - c. Possible variable resistance device on tap
  3. Force needed to overcome that resistance comes from two potential sources:
    - a. Total gas pressure applied to keg
    - b. Beer pumps
- E. On-premises draught equipment and maintenance
1. Anatomy of a standard keg
    - a. Common commercial volumes
    - b. Awareness of variety in keg valve systems/coupler types
      - i. Couplers common in the UK: A, S, G, U, KeyKeg
    - c. Internal structure of the keg
  2. Pressure side components, anatomy and function
    - a. Gas sources
    - b. Cylinder/bulk tank
    - c. Nitrogen generator
    - d. Air compressor
      - i. May be used with “bag-in-ball” type kegs (e.g., KeyKeg)
      - ii. Used to run beer pumps
    - e. Gas blenders
    - f. Primary and secondary gas regulators
    - g. Tubing and hoses
      - i. Gas lines are 3/8” outside diameter and colour coded by gas/blend
        - 100% CO<sub>2</sub>: grey
        - 60/40 CO<sub>2</sub>/N<sub>2</sub>: white
        - 30/70 CO<sub>2</sub>/N<sub>2</sub>: green
        - 50/50 CO<sub>2</sub>/N<sub>2</sub>: purple/violet
        - Nitrogen: black
        - Compressed air: blue
      - ii. Note: 15mm (0.6”) outside diameter black hose is used as heat dump pipe to vent heat from the cellar to an exterior heat dump in some cellars

3. Beer side components, anatomy and function
  - a. Couplers
  - b. Drop line
  - c. FOB (Foam on Beer) monitors/detectors
  - d. Beer pump
  - e. Beer line
  - f. Cleaning socket and line
  - g. Font, T-bar, or draught tower
  - h. Beer tap (faucet)
    - i. Free Flow Tap
      - Lever assembly
      - Body (coupling washer)
      - Spout pack: nozzle, flow straightener, restrictor plate, o-rings
      - Variable resistance (flow control) – some feature an adjustment knob around the shank or a lever on the side of the tap that is used to adjust resistance
4. Cooling systems
  - a. Temperatures:
    - i. Cellar's temperature controlled at 11-13° C<sup>1</sup>
    - ii. Cask ales typically dispensed at cellar temperature
    - iii. Keg beer typically dispensed 5-8° C<sup>2</sup>
      - Chilled by ice bank or flash chiller in cellar
    - iv. "Extra cold" products dispensed at 2-5° C<sup>3</sup>
      - Also chilled by ice bank or flash chiller in cellar
      - Chilled fonts sometimes used for additional cooling
  - b. Pythons (a.k.a. "loom") used to keep beer cold en route to font
    - i. Insulated bundle of hoses, various configurations of product and coolant lines
    - ii. Beer hose carries beer from cellar to bar
    - iii. Coolant lines carry chilled water or glycol to maintain beer temperature
      - Ale Python Controller chills water for cask lines
      - Python Temperature Controller chills water or a glycol mix for keg lines
  - c. Additional cooling
    - i. Secondary cooling may be applied at the bar: trim chilling, extra cold
    - ii. Sometimes keg beer is cooled to service temperature at the bar
5. Draught system operation
  - a. Standard cellar and system temperature of 11-13 °C
  - b. Troubleshooting (keg and cask)
    - i. No beer at dispense
    - ii. Fobbing (Beer foaming)
    - iii. Flat beer

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<sup>1</sup>"Profit Through Quality" Edition 7, June 2013. BIIAB p 54.

<sup>2</sup> Ibid.

<sup>3</sup> Ibid.

- iv. Hazy or cloudy beer
- v. Taste is off
- 6. Draught system maintenance (keg lines)
  - a. Tap nozzles should be removed, cleaned with water, and allowed to dry each night. Be sure to match the proper nozzle to each brand when reattaching
  - b. Draught line cleaning: taps, lines, FOB detectors, couplers
  - c. Use proper personal protective equipment (gloves, goggles, rubber apron)
  - d. Criteria for proper line cleaning
    - i. Frequency (every 7 days or less)
    - ii. Cleaner: use a cleaning solution designed for the purpose as recommended by the brewer, brand owners, or draught supplier
    - iii. Concentration – Mix in exact proportions specified by container
    - iv. Temperature – Follow directions for cleaning solution
  - e. Cleaning system components:
    - i. Cleaning head
    - ii. Cleaning solution supply lines
    - iii. Cleaning vessel/bottle
    - iv. Coupler cleaning brush
  - f. Cleaning procedure (keg beer)
    - i. Preparation for cleaning
      - 1. Switch remote chiller to cleaning mode or off
      - 2. Inform staff cleaning is in process; place notice on taps
      - 3. Put on personal protective equipment
      - 4. Turn off gas to keg beers
      - 5. Disconnect coupler from keg and clean with coupler brush
      - 6. Attach coupler to cleaning socket on wall
      - 7. Fill cleaning vessel with cold clean water
      - 8. Turn on gas supply for cleaning
    - ii. Water flush
      - 1. Flush FOB monitors with cold water
      - 2. Run beer from lines with cold water
    - iii. Cleaning
      - 1. Measure cleaning solution and add to cleaning vessel
      - 2. Flush FOB monitors with cleaning solution
      - 3. Run cleaning solution through lines and let stand for 5 minutes
      - 4. Repeat previous step at least 3 more times for a total minimum contact time of 20 minutes for each line with the cleaning solution
    - iv. Flush out cleaning solution with water
      - 1. Empty any remaining cleaning solution from cleaning vessel, refill with cold fresh water
      - 2. Flush FOB monitors with water
      - 3. Flush beer lines with water
      - 4. Use test strips to ensure that all cleaning solution has been flushed from the lines
      - 5. Turn off gas supply for cleaning
    - v. Prepare for service

1. Reconnect couplers to kegs
  2. Fill FOB monitors with beer
  3. Turn on gas supply to keg couplers
  4. Pour water from lines with beer
  5. Switch remote chiller back on
  6. Check beers for taste, clarity and aroma
- g. Safety issues: operator, consumer
- F. 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 allow room for head to form
      - ii. The standard serving size for a beer will be based on alcohol content (stronger beer, smaller glass) and product cost
      - iii. Standard pour should be 95% beer; 5% foam
      - iv. Customer has the right to a top up
    - b. Shape
      - i. Cultural and historical traditions connect certain glasses to specific styles
      - ii. Aesthetics of presentation
      - iii. Flavour and aroma effects
    - c. Brand
      - i. Branded glasses matched to beer
  2. Use beer clean glassware
    - a. Daily glass washing
      - i. Each glass must be cleaned before refilling. Do not refill a used glass
      - ii. Empty remaining contents of glass into sink/drain or garbage before you begin the cleaning process. Drinks and debris must not be dumped in glasswasher
      - iii. A brush bowl or finger sponge charged with non-foaming glass detergent should be used to remove lipstick and other visible deposits from rim
      - iv. Glasses used for cream-containing drinks should be sent to the kitchen for washing in the dishwasher. Otherwise fat from cream will coat the glassware and glass-washing machine resulting in poor head retention
      - v. For machine washing:
        1. Place glass upside down on the rack of the bar dishwasher
        2. Ensure that the machine is supplied with the manufacturer's recommended detergent and glasswashing rinse aid
        3. Wash cycle must use water at a minimum temperature of 55 °C. Higher temperatures may be recommended
        4. Rinse cycle must use water at a minimum temperature of 65 °C. Higher temperatures may be recommended
        5. After washing, glasses should be left to drip dry and cool for 30 minutes before storage or use

6. Periodically check the interior of the dish washer to be sure that it is free of mould and debris
  - b. Renovation
    - i. Minerals or protein can build up on glasses after repeated washing
    - ii. Cleaning with a special “renovate” detergent can return them to ideal condition. Follow manufacturers recommendations
  - c. Checking glass for “beer clean”
    - i. Without beer
      - Sheeting (wet glass, empty, water should sheet off of glass evenly; formation of droplets (rain on the window) or webbing indicates not beer clean) (a.k.a. “Waterbreak”)
      - Salt test (wet glass, 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 sides of glass (in liquid beer) indicate **not** beer clean
      - During consumption, a bit of foam (so called “lace”) will cling to the side of a beer clean glass following each sip
  - d. Glass temperature
    - Glasses should not be warm to the touch when filled
    - Room temperature and chilled glasses are acceptable
    - Frozen/frosted glasses are not recommended: causes foaming, makes beer too cold, frozen water or sanitizer may be present
- G. Serving bottled beer
1. Prepare for service
    - a. Bottle-conditioned beer should be stored upright prior to service
    - b. All bottled beer should be stored in refrigerator for 8 to 24 hours prior to service
    - c. Service temperature for bottled beer is 4° C 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 gunk at liquid level in neck—generally indicative of a bad bottle if present. Do not serve beer in this condition
    - c. Check for yeast on bottom of bottle
      - i. Retain yeast in bottle unless:
        - Consumer requests yeast to be poured
        - Style (e.g., Weissbier) is traditionally poured with yeast
      - ii. To pour yeast, rouse by swirling, rolling, or inverting
  3. Opening bottle: twist-off, pry-off, cork, combo
    - a. Twist-off caps
      - i. Twist off by hand
      - ii. Napkin may be used to aid grip and protect hand

- b. Pry-off caps
    - i. Prefer openers with a bar or other lift area at least ¼ inch wide to prevent possibility of breaking the bottle during opening
    - ii. Lift in one motion
  - c. Mushroom cork
    - i. Remove wire cage by untwisting the tab
    - ii. Remove cork by hand—napkin may aid grip
    - iii. Be gentle so as not to disturb sediment and make beer volatile
    - iv. Practice cork safety—keep bottle pointed away from consumer at all times
  - d. Cap plus cork: corkscrew will be required after removing cap
  - e. Present the cork (always) or the cap of a rare, unusual, or new beer, to the consumer
  - f. Check bottle lip: do not serve beer from bottles with broken/damaged lips
  - g. Also examine bottle lip for rust, dried beer, or yeast that could affect flavour or appearance of beer
4. 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 glass at 45-degree angle, pour down the side until glass is half full
    - iii. Gently tilt glass upright and pour down the middle to create approximately one inch of foam head on the beer as the pour finishes. Weizens and Belgian ales traditionally have two to four inches of head
  - b. Unfiltered beers
    - i. Some beers are packaged with yeast in the bottle or completely unfiltered
    - ii. Unfiltered beer should still be poured using the method described above in section I.F.4.a
    - iii. In most cases, yeast should be retained in the bottle. Be prepared to stop pouring when the yeast moves toward the top of the bottle
    - iv. When in doubt about pouring yeast, ask the consumer their preference
- H. Serving draught beer
- 1. Pouring a draught lager or keg ale
    - a. Hold glass at 45-degree angle, one inch below the tap faucet. Do not allow tap to come in contact with the glass or its contents during dispense
    - b. Pull tap handle forward to the fully open position to start the flow of beer
    - c. Pour down the side of the glass
    - d. As the glass fills, gently tilt glass upright. For the final inch or two, pour down the middle to create an appropriate amount of head on the beer
    - e. Close faucet as foam cap reaches the top of the glass to prevent beer waste
    - f. Target depth for head is 10 mm (~1/2 inch)
    - g. Beer served in lined glasses must have liquid to the line
    - h. Non-lined glasses: 95% of glass contents must be liquid and customers who request a top-up must be accommodated
  - 2. Pouring nitro stout
    - a. Hold glass at 45-degree angle, one inch below the tap faucet. Do not allow tap to come in contact with the glass or its contents during dispense



- b. Pull tap handle forward to the fully open position to start the flow of beer
  - c. Pour down the side until glass is three-quarters full
  - d. Settle for 1-2 minutes then fill to the top, with head in accordance with brand-owner's directions
3. Changing a keg (same product)
    - a. Kegs must be in the beer cellar for at least 24 hours before serving
    - b. For D-, G-, S-, and U-type couplers:
      1. Grip keg coupler handle, pull out and raise to the "up" or "off" position to disengage. Turn the coupler a quarter turn (90 degrees) counterclockwise to unseat. Lift off of the keg
      2. 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
    - c. For A- and M-type couplers:
      1. Grip keg coupler handle, depress the button on the underside of the handle (if a button is present), and raise to the "up" or "off" position to disengage. Slide the coupler off of the keg valve
      2. Slide the coupler on to the keg valve of a new keg. Lower the coupler handle to the "down" or "on" position to engage
    - d. When present, the foam-on-beer (FOB) detector 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
  4. Changing products on a line
    - a. Ensure that the proper coupler for the new product is correctly installed
    - b. If necessitated based on contrast between products, rinse or clean lines
    - c. Ensure that gas blend and pressure are properly set for the new product
- I. Cask-conditioned ale
    - a. Definition of Real Ale (CAMRA)
    - b. Conditions required to achieve carbonation
    - c. Cask dispense
      - i. Anatomy of a cask
      - ii. Common cellar systems
        1. Traditional stillage
        2. Autotilt stillage
        3. Siphon (syphon)
        4. Widge (floating inlet)
    - d. Cellaring real ale
      - i. Brewer will provide guidelines for settling and conditioning the beer.
      - ii. Use of soft and hard pegs or spiles
      - iii. Tapping
      - iv. Assessing readiness for service
        - Clarity
        - Condition
        - Aroma
        - Taste
        - Temperature

- v. Spile management
  - 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\*
  - \* 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
- vi. Tilting
- e. Cask ale service
  - i. Gravity dispense
  - ii. Beer engine
    - Short spout
      1. Hold glass at 45-degree angle, making sure that spout does not touch the glass or its contents throughout the filling process
      2. Pull the handle smoothly and steadily. Straighten the glass gradually as it fills. Aim for no more than 10 mm of foam
    - Swan neck
      1. Hold clean glass vertically with sparkler positioned against the bottom of the glass
      2. Pull pump smoothly, keeping sparkler against the bottom of the glass until it is full
      3. Allow to settle. To top up, keep the nozzle in the liquid beer. If using a sparkler, foam should be no more than 10 mm high
      4. Regularly wipe down the swan neck with a clean, micro-fibre, lint-free cloth
- f. Cask ale inventory management<sup>4</sup>
  - i. Sell a cask within three days of putting it on dispense
  - ii. If two beer engines serve the same beer, use a double cask tap (one container to two beer engines) to empty the cask more quickly
  - iii. Stock levels for continuous supply of standard ales
    - Minimum stock level: 3 days demand
    - Maximum stock level: 10 days demand
  - iv. Rotate stock in the cellar, using oldest stock first
  - v. Only store casks in temperature-controlled cellar; do not store food in beer cellar
- g. Maintenance: weekly or on cask changes
  - i. Dismantle and clean cask taps and extractors with line cleaning solution and brush immediately after use
  - ii. Store pegs/spiles, hop filters, and cask taps in clean, dry conditions
  - iii. Scrub autotilts and stillages weekly
  - iv. Cask line cleaning
    - Follow instructions given in E.6.f
    - Clean weekly or after each cask

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<sup>4</sup> “Profit Through Quality” Edition 7, June 2013. BIIAB p 18

## II. Beer Styles

- A. Understanding beer styles
  - 1. The 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.
  - 2. Catalogued today in the US, principally by
    - a. Beer Judge Certification Program<sup>5</sup>
    - b. Brewers Association<sup>6</sup>
- B. Style parameters
  - 1. Knowledge requirements
    - a. Upper and lower quantitative limits for ABV, IBUs, and EBC for all styles
    - b. Qualitative understanding of carbonation and mouthfeel for all styles
    - c. Three commercial examples covering classic producers and other notable producers of the style globally
  - 2. Quantitative parameters of beer character
    - a. Alcohol content (ABV)
    - b. International Bitterness Units (IBUs)
    - c. Color
      - i. EBC
      - ii. SRM ( $SRM \times 1.97 = EBC$ )
    - d. Carbonation (Volumes of CO<sub>2</sub> or g/L)
    - e. Original Gravity
    - f. Apparent attenuation
  - 3. Qualitative parameters of beer character
    - a. Aroma
    - b. Flavour
    - c. Aftertaste
    - d. Mouthfeel
    - e. Perceived bitterness
    - f. Appearance
- C. History, characteristics, and flavour attributes of styles by region
  - 1. Belgium and France
    - a. Lambic beers
      - i. Lambic
      - ii. Gueuze
      - iii. Fruit Lambic (Kriek, Framboise, etc.)
    - b. Flanders ales
      - i. Flanders Red Ale
      - ii. Oud Bruin

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<sup>5</sup> The Cicerone® Certification Program uses the 2015 BJCP Style Guidelines as the reference source for all matters related to style in its exams. You can access the guidelines online at [www.bjcp.org](http://www.bjcp.org) and through their mobile device apps.

<sup>6</sup> Certified Cicerone® and Advanced Cicerone™ candidates should be aware of the Brewers Association guidelines. Master Cicerone® candidates should have familiarity with the general differences between the BA and BJCP guidelines, and should have knowledge of BA categories that do not exist in the BJCP guidelines.

- c. Trappist and abbey ales
    - i. Belgian Dubbel
    - ii. Belgian Tripel
    - iii. Belgian Dark Strong Ale
  - d. Pale Belgian beers
    - i. Blond Ale
    - ii. Belgian Pale Ale
    - iii. Belgian Golden Strong Ale
  - e. Unique beers
    - i. Saison
    - ii. Bière de Garde
    - iii. Witbier
2. Britain and Ireland
- a. England
    - i. Pale ales
      - Ordinary Bitter
      - Best Bitter
      - Strong Bitter
      - British Golden Ale
      - English IPA
    - ii. Dark ales
      - Dark Mild
      - British Brown Ale
      - London Brown Ale
      - English Porter
      - Sweet Stout
      - Oatmeal Stout
      - Foreign Extra Stout
    - iii. Strong ales
      - Old Ale
      - English Barleywine
  - b. Scotland
    - i. Scottish Light
    - ii. Scottish Heavy
    - iii. Scottish Export
    - iv. Wee Heavy
  - c. Ireland
    - i. Irish Red Ale
    - ii. Irish Stout
3. Germany, Czech Republic, and Austria
- a. Lagers
    - i. Pale
      - German Pils
      - Munich Helles
      - Czech Premium Pale Lager
    - ii. Amber or dark

- Vienna Lager
- Festbier
- Märzen
- Munich Dunkel
- Schwarzbier
- Rauchbier
- iii. Bocks
  - Helles Bock
  - Dunkles Bock
  - Doppelbock
  - Eisbock
- b. Ales
  - i. Wheat beers
    - Weissbier
    - Dunkles Weissbier
    - Weizenbock
    - Berliner Weisse
    - Gose
  - ii. Rhine Valley ales
    - Altbier
    - Kölsch
- 4. United States
  - a. Pale lagers
    - i. American Light Lager
    - ii. American Lager
  - b. Pale ales
    - i. American Wheat Beer
    - ii. American Blonde Ale
    - iii. American Pale Ale
    - iv. American Amber Ale
  - c. IPAs
    - i. American IPA
    - ii. Double IPA
  - d. Dark ales
    - i. American Brown Ale
    - ii. American Porter
    - iii. American Stout
    - iv. Imperial Stout
  - e. Strong ales
    - i. American Barleywine
  - f. Beers made with special ingredients or processes
    - i. Alternate grains and malts (e.g., rye)
    - ii. Smoked malts
    - iii. Sugars and other non-malt fermentables (e.g., honey)
    - iv. Fruits and vegetables
    - v. Herbs, spices, and natural flavourings (e.g., coffee, chocolate)

- vi. Fermentation with non-Saccharomyces organisms (e.g., *Brettanomyces* species)
  - vii. Fermentation or aging with barrels/wood of various types
5. Other regions
- a. International
    - i. International Pale Lager
  - b. Scandinavia
    - i. Baltic Porter

### III. Beer Flavour and Evaluation

#### A. Taste and flavour

1. How we perceive flavour
  - a. Aroma
    - i. Orthonasal
    - ii. Retronasal
  - b. Taste
    - i. Established
      - Sweet
      - Salty
      - Sour
      - Bitter
      - Umami
    - ii. Emerging
      - Fat
  - c. Mouthfeel
    - i. Body
    - ii. Carbonation
    - iii. Astringency
    - iv. Creaminess
    - v. Alcoholic warming
2. Variations in taste perception
  - a. Genetic and biological differences
  - b. Physiological factors
  - c. Personal/behavioural factors
    - i. Smoking, coffee, food preferences
    - ii. Consumption habits
  - d. Mental and psychological factors
3. Beer evaluation
  - a. Setting and tools
    - i. Environment for tasting
    - ii. Drinking vessels and other accessories
    - iii. Beer temperature
  - b. Components of evaluation
    - i. Appearance
    - ii. Flavour profile
      - Aroma

- Taste
  - Mouthfeel
  - Aftertaste
  - c. Key evaluation techniques
    - i. Aroma techniques
      - Distant Sniff: Swirl beer while holding glass six to eight inches away from nose and take one to two short sniffs
      - 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 three to five
    - ii. Use consistent background to assess colour and clarity
    - iii. Beer should reach all parts of 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. Hops
    - a. Bitterness, flavour and aroma effects
    - b. Traditional regional hop traits
      - i. American: Piney, citrus, resinous, tropical fruit, catty
      - ii. English: Earthy, herbal, woody
      - iii. German/Czech: Floral, perfumy, peppery, minty
  3. Fermentation flavours
    - a. Ale versus lager flavours
    - b. Weizen yeast flavour
    - c. Acidic fermentation (lactic, acetic)
    - d. Brettanomyces
- C. Identify common beer off flavours by name and source
1. From *Saccharomyces cerevisiae*
    - a. Diacetyl
    - b. Sulphur flavours
      - i. H<sub>2</sub>S (hydrogen sulphide)
    - c. Acetaldehyde
    - d. Phenols
      - i. Know range of flavours associated with phenols
      - ii. 4-vinylguaiacol
    - e. Esters
      - i. Know range of flavours associated with esters
  2. From other organisms
    - a. Diacetyl

- b. Phenols (see 1d above)
  - c. Acetic acid
  - d. Lactic acid
  - 3. Packaging and storage
    - a. Oxidation/aging flavours
      - i. Honey
      - ii. Papery/wet cardboard (trans-2-nonenal)
      - iii. Waxy/lipstick
      - iv. Sherrylike
      - v. Increased toffee/caramel
      - vi. Decreased bitterness
    - b. Lightstruck/skunky
    - c. Autolysis
  - 4. Process and ingredients
    - a. Isovaleric acid
    - b. Metallic
    - c. DMS
    - d. Astringent/tannic
- D. Perform the following under test conditions:
- 1. By taste, detect and identify a limited set of off-flavours (acetaldehyde, acetic acid, diacetyl, DMS, and trans-2-nonenal) by comparing spiked samples to a control beer
  - 2. By taste, correctly categorize a sample as one of two beer styles
  - 3. Based on your analysis of a given commercial example, identify whether the sample is fit for service or whether the sample exhibits flaws caused by improper handling

#### **IV. Beer Ingredients and Brewing Processes**

##### **A. Ingredients**

- 1. Grains
  - a. Malted barley
    - i. Why barley used for brewing
    - ii. Species of barley, cultivation areas
    - iii. Malting: process stages and steps
    - iv. Process variations that lead to different malt types
      - Kilned: Pils, Pale Ale, Vienna, Munich, Victory
      - Stewed: Crystal/caramel malts
      - Roasted: Chocolate, Black Patent
  - b. Wheat, oats, rye, and other specialty grains
    - i. Sensory contributions to finished product
  - c. The use of corn and rice in beer
    - i. Contributions to wort and beer
    - ii. Requirements for processing
    - iii. Styles where used
- 2. Hops
  - a. Anatomy of hop plant and cone
  - b. Cultivation



- i. Structure and layout of hop field
    - ii. Harvesting, drying, and baling
    - iii. Storage and delivery to breweries
  - c. Major growing regions
    - i. Continental Europe
      - Germany
      - Czech Republic
      - Belgium
      - Slovenia
      - Poland
      - France
    - ii. Britain
      - Kent
      - Sussex
      - Herefordshire
      - Worcestershire
    - iii. United States
      - Yakima Valley, Washington
      - Oregon
      - Idaho
    - iv. Australia and New Zealand
  - d. Categories of hops
    - i. Bittering hops (high alpha acid)
    - ii. Aroma hops (desirable flavour and aroma properties)
      - Noble hops (Hallertau Mittelfruh, Spalt, Tettnang, Saaz)
    - iii. Dual use hops (possessing properties of both bittering and aroma hops)
  - e. Chemistry
    - i. Alpha acids, isomerization, and IBUs
    - ii. Hop oils determine flavour and aroma
  - f. Hop forms and products used in brewing
    - i. Whole hops
    - ii. Pellet hops
    - iii. Extracts
      - Alpha acid
      - Hydro-isomerized alpha acid (skunk resistant)
  - g. Uses and effects during brewing
    - i. Bittering contribution of hops added at different times during the boil
    - ii. Flavour and aroma hop additions and effects
      - Boil
      - Hot wort steep/whirlpool
      - Dry hopping
3. Yeast
  - a. Taxonomy
    - i. Ale yeast
      - *Saccharomyces cerevisiae*

- Generally produce esters in levels which give fruity flavours to finished beers
        - Some possess a phenolic off-flavour gene (POF+) 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
      - iii. Wild yeast
        - Non-brewing strains of *Saccharomyces* can cause off flavours or excessive attenuation
    - b. Non-*Saccharomyces* organisms
      - i. Important organisms
        - *Brettanomyces* species
        - *Acetobacter* species
        - *Lactobacillus* species
        - *Pediococcus* species
      - ii. Intentional use
      - iii. Unintentional appearance
  - 4. Water
    - a. The importance of water in brewing
    - b. Chemistry of water
      - i. Chlorine
        - Off flavours associated with chlorine
        - Common techniques for removal
      - ii. Water cycle and sources of salts
      - iii. Water traits of classic brewing cities: Munich, Pilsen, Burton-on-Trent
  - 5. Other ingredients
    - a. Specialty ingredients
      - i. Sugars
        - Fermentable
          - Corn sugar/dextrose/glucose
          - Candi sugar
          - Honey, molasses
        - Non-fermentable
          - Lactose
      - ii. Fruits and vegetables
      - iii. Herbs and spices
        - Common cooking herbs/spices
        - Chili peppers
        - Coffee, cocoa, chocolate, teas
    - b. Historical precedent for addition of non-traditional ingredients
- B. Processes
  - 1. Milling
    - a. Possible flavour impact of milling on finished beer

2. Mashing
  - a. General description and goals
  - b. Awareness of other mashing methods (cereal mash, step mash, decoction mash)
3. Lautering
  - a. Objectives of lautering
  - b. General process of lautering
    - i. Initiate wort run-off
    - ii. Vorlauf (recirculation)
    - iii. Begin collection of wort for boiling
    - iv. Sparge
4. Boiling
  - a. Process and objectives of boiling
    - i. Inputs and outputs
    - ii. Significant physical and chemical changes
  - b. Flavour impacts of boil
5. Whirlpool
  - a. Objectives of whirlpool
  - b. General operation of whirlpool including wort removal
6. Chilling
  - a. Modern methods of wort chilling
    - i. Heat exchanger
    - ii. Coolship
  - b. Flavour issues associated with wort chilling
7. Aeration and pitching
  - a. When wort is aerated in the brewing process
  - b. Reasons for wort aeration
8. Fermentation (*Saccharomyces cerevisiae* or *Saccharomyces pastorianus*)
  - a. General description of fermentation
    - i. Ale fermentation
    - ii. Lager fermentation
  - b. Major biochemical inputs and outputs
    - i. Input: Sugars
    - ii. Outputs: Alcohol and carbon dioxide
  - c. Resulting flavour compounds (see flavour section, III.C.1)
  - d. Equipment used for fermentation
  - e. Variations in fermentation temperature and their flavour impact
9. Lagering
  - a. Objectives of lagering
  - b. Lagering temperature and duration
  - c. Impact on finished beer characteristics
10. Aging
  - a. Flavour impacts of aging
    - i. In stainless steel
    - ii. In new wood
    - iii. In previously used wood

- b. Factors influencing flavours produced
  - i. Prior use of vessel
    - Residual flavours from other liquids
    - Microflora
- 11. Clarification
  - a. Common methods used for beer clarification
    - i. Filtration
    - ii. Finings
    - iii. Settling/aging
- 12. Carbonation
  - a. Carbonation levels found in beer (by style or type) in volumes of CO<sub>2</sub>
  - b. Methods of achieving carbonation in beer, when and how used
    - i. Capture during fermentation
    - ii. Forced carbonation
    - iii. Secondary fermentation in serving vessel
  - c. Sensory impact of carbonation on finished beer
- 13. Packaging and pasteurization
  - a. Package types
    - i. Draught
      - Keg
      - Cask
    - ii. Bottles
    - iii. Cans
  - b. Force-carbonated vs. package conditioned (e.g., bottle conditioned)
  - c. Quality control
    - i. Cleaning/sanitizing of containers
    - ii. Importance of air exclusion during packaging
    - iii. Cap-on-foam
  - d. Pasteurization and its impact on beer
    - i. Impact on stability and flavour

## V. Pairing Beer with Food

*No single model perfectly explains all the dynamics of beer and food pairing. This syllabus draws from various sources to present common concepts and accepted principles. Candidates can expect exam questions on the following guidelines. They will also be asked to demonstrate an understanding of these concepts by naming beers or beer styles to pair with various foods and dishes.*

- A. Possible outcomes of successful beer and food pairings
  - 1. Desirable flavours are highlighted in both the beer and the dish
  - 2. Combination of the two invokes memory, emotion, and/or deeper thought
  - 3. Pairing creates new flavours not originally present in either the beer or the dish
- B. Beer and food vocabulary
  - 1. Beer vocabulary
    - a. For common beer flavour descriptors, see section III.B
  - 2. Food vocabulary
    - a. Describe specific food tastes beyond basic identification of key ingredients and

preparation (e.g., instead of “seared scallop”, use “scallop has a caramelised, crispy sear with rich toasted and toffee flavours, while the dense interior has a buttery sweetness”)

- b. Understand basic cooking techniques and their effects on flavour (e.g., poaching, roasting, frying, etc.)
- c. Familiarity with a range of commonly encountered foods and ingredients (e.g., vegetables, fruits, herbs, spices, etc.)

### C. Pairing concepts

1. Intensity (sometimes referred to as “impact” or “weight”)
  - a. A beer’s intensity is determined by the levels of several characteristics
    - i. Malt flavour
    - ii. Hop bitterness
    - iii. Sweetness/body (note that these are related)
    - iv. Alcohol content
    - v. Carbonation
    - vi. Tartness/sourness
    - vii. Fermentation derived flavours (esters, phenols, etc.)
    - viii. Hop flavour/aroma
    - ix. Special ingredients/processes (e.g., fruit, coffee, barrel-aging, etc.)
  - b. A dish’s intensity is determined by the interplay of several characteristics
    - i. Flavour impact of individual ingredients
    - ii. Preparation/cooking method
    - iii. Spices used
    - iv. Sauces served alongside
    - v. Levels of fat, umami, sweetness, bitterness, saltiness, sourness, etc.
2. Flavour interactions
  - a. Interactions between similar flavours
    - i. Complement/resonance—Similar or compatible flavours present in both the beer and the food complement one another (e.g., an Indian curry with cloves resonates with the clove flavours found in a Dunkles Weissbier)
  - b. Interactions between dissimilar flavours
    - i. Contrast—By offering an opposing flavour, the beer highlights a flavour in the dish or vice versa. (e.g., mussels served with Gueuze seem richer and sweeter due to the acidity of the beer)
    - ii. Cut—Some beer traits help refresh the palate by lifting, cleansing, or removing rich or fatty flavours from the palate. Common “cutting” beer traits include carbonation, sourness, and bitterness, and to a lesser extent, alcohol and roastiness

### D. Common beer and food interactions

1. Malt flavours
  - a. Complement toasted and caramelized flavours in a variety of foods
  - b. Soothe/soften capsaicin “heat”
2. Hop flavours
  - a. Depending on hop variety, can complement fruit, citrus, herb, and spice flavours
3. Fermentation-derived flavours

- a. Esters
  - i. Harmonize with fruit flavours
- b. Phenols (clove and peppercorn flavours)
  - i. Resonate with spices
  - ii. Contrast fat and umami
- 4. Carbonation
  - a. Cuts fat, umami, and sweetness
  - b. Accentuates capsaicin “heat”
- 5. Bitterness
  - a. Cuts fat, umami, and sweetness
  - b. Accentuates capsaicin “heat”
  - c. Can create harsh or metallic effects with certain foods (e.g., oily fish)
  - d. Can harmonize with bitter foods (e.g., bitter salad greens)
- 6. Roastiness
  - a. Complements chocolate, caramelized, and burnt flavours
  - b. Cuts fat
  - c. Contrasts sweetness
- 7. Alcohol
  - a. Can cut fat
  - b. Generally resonates with sweetness
  - c. Can accentuate capsaicin “heat”
- 8. Tartness/sourness
  - a. Can brighten some food flavours
  - b. Can complement or accentuate sour flavours
  - c. May favourably contrast fat, umami, or salt
- 9. Sweetness
  - a. Soothes capsaicin “heat” and other spices
  - b. Accentuated by saltiness
- E. Creating a pairing
  - 1. Match intensities of both beer and dish so that neither overpowers the other
  - 2. Consider the flavour interactions listed in sections V.C.2 and V.D to hone the pairing
- F. Designing a meal
  - 1. Intensity of dishes and pairings generally increases as the meal progresses
- G. Classic beer and food pairings
  - 1. European traditions
  - 2. Recommended literature
    - a. *Brewmaster’s Table*, Garrett Oliver
    - b. *Tasting Beer*, Randy Mosher
- H. Cooking with beer
  - 1. Common uses
    - a. Used in place of water or other liquid as an ingredient or cooking medium
  - 2. Flavour effects
    - a. Concentrating beer through cooking intensifies non-volatile flavours
      - i. Bitterness can intensify exponentially and may become unpleasant
      - ii. Malt flavours and sweetness increase, sugars caramelize

- iii. Volatile hop and ester flavours decrease and may disappear entirely
- iv. Astringent/burnt flavours of roasted malt can increase and may become unpleasant
- b. Delicate hop and fermentation flavours in beer can be brought to a dish by not cooking the beer (e.g., using an IPA in a salad dressing)

## VI. Additional Sources

Adaptation of the Cicerone syllabus for the UK has been made possible by input from a number of individuals and organizations to whom we are indebted. The following document has also provided details and specifics which candidates may find to be of use.

***Profit through Quality: A guide to cellar management and beer dispense.*** Version 3.  
<http://www.wiganbeer.co.uk/wp-content/uploads/2015/12/profit-through-quality-bbpa.pdf>

In addition, we found useful advanced information in:

***BDA Installation Guidance Manual for New and Major Refurbished Accounts***  
Produced by BDA Technical Group. Issue 3 Update March 2013