



**COFFEE
SKILLS
PROGRAM**

Brewing

Foundation | Intermediate | Professional





**COFFEE
SKILLS
PROGRAM**

Brewing

Intermediate



Specialty
Coffee
Association



BREWING

Title of module	Brewing
Level	Intermediate
Recommended course hours	12 hours (including instruction and practical time)
Course aim	Overview: designed to introduce the concept of scientifically measuring coffee extraction and to explore the elements of coffee brewing, brewing intermediate helps the coffee professional manipulate brew techniques to improve coffee quality.
Information for trainer	Brewing Foundation is a recommended pre-requisite All coffee brewed during this course will be measured and charted by the AST for Strength and Extraction. Allow for discussion and questions.

Subject/ code	Sub code	Knowledge/ skills	Objective	References
1.0 RESEARCH HISTORY				
	1.01.01	HISTORY The historical journey of the brewing research from 1952 to present, covering original research in the US, and subsequent research by the Speciality Coffee Association of Europe in 2011	Identifies key pieces of research over the past 60 years	European Coffee Extraction Preferences: SCAE 2013 The SCAE Water Chart 2016
2.0 BREWING PROCESS				
	2.01.01	BREWING The brewing process	Explains what happens from the second the water contacts the grounds until the brew has finished. Explains which solids come out and when.	Water quality Handbook: SCAA Coffee Brewing Handbook. Lingle

	2.01.02	<p>The important of allowing the brew cycle to complete before serving a drink</p> <p>ACTIVITY Students will:</p> <ul style="list-style-type: none"> • sample a brew split into three different stages • sample stages 1 & 2 combined. • sample the complete brew. 	Identifies the importance of allowing the brewing cycle to complete before sampling the brew or serving the beverage	Coffee Brewing - wetting, hydrolysis & extraction revisited SCAA - Emma Sage
	2.01.04	<p>The ideal extraction range – 18% to 22%</p> <p>ACTIVITY Students will undertake sensory tastings of various extractions at the same strength</p>	Identifies the generally accepted ideal extraction range as being 18% to 22%	
	2.01.05	<p>The correct strength range – 1.15% and above</p> <p>ACTIVITY Students will undertake sensory tastings of various strengths at the same extraction</p>	Identifies the generally accepted strength range as being 1.15% and upwards	
	2.01.06	<p>The maximum extraction possible from the bean – 30%</p> <p>Note: extraction maximum will vary dependent upon origin, age, roast profile of coffee amongst other variables</p>	Identifies the maximum extraction possible as being approximately 30%.	

**3.0 BREWING AND
CHARTING
COFFEE**

	<p>3.01.01</p>	<p>CHARTING FILTER COFFEE The Coffee Brewing Control Chart</p> <p>ACTIVITY Students will chart brews on the Coffee Brewing Control Chart.</p>	<p>Demonstrates how to brew, measure dissolved solids and chart filter coffee on the Coffee Brewing Control Chart</p> <p>Brews between 18% and 22% extraction at a minimum of 50g per litre.</p>	
	<p>3.01.02</p>	<p>Coffee brewed from a variety of different brew methods can be measured on the Coffee Brewing Control Chart</p>	<p>Demonstrates how coffee brewed by various brew methods, from filter to espresso, can be measured.</p>	
	<p>3.01.03</p>	<p>Measuring Methods – Measuring coffee Total Dissolved Solids (TDS) and manually calculating extraction %</p>	<p>Shows manual calculations for TDS & Extraction %</p>	
	<p>3.01.04</p>	<p>CHARTING ESPRESSO Charting espresso, including espresso measurement guidelines</p>	<p>Demonstrates how to measure 8% to 11% strength and achieve at 18 to 22% extraction.</p> <p>Brews and charts espresso</p>	

**4.0 BREWING
GUIDELINES**

	<p>4.01.01</p>	<p>WATER TO COFFEE RATIO</p> <p>Sufficient ground coffee is required, per litre of water, to make a quality cup of coffee.</p> <p>SCA Gold Cup standard: >50g/L or 3.5oz/gal or 1:20 (coffee to water)</p> <p>ACTIVITY</p> <p>Students will sample:</p> <ul style="list-style-type: none"> • 45g/L or 1:22 or 2.75 oz per half gal; • 60g/L or 1:17 • 75g/L or 1:13, with all other brew parameters equal. 	<p>Identifies the correct coffee to water ratio required to achieve coffee brewed to the SCA Gold Cup standard</p>	
	<p>4.01.02</p>	<p>GRIND SIZE</p> <p>Grind size affects the rate of extraction (based on surface area) and the flow rate of water through the coffee bed.</p> <p>ACTIVITY</p> <p>Students will sample brews made with fine, coarse and medium grinds, with the following brew parameters equal:</p> <ul style="list-style-type: none"> • Coffee to water ratio. • Water delivery time. • Temperature 	<p>Identifies, through sampling different brews, the impact of grind size on extraction</p>	
	<p>4.01.03</p>	<p>BREW TIME</p> <p>The amount of time the water is in contact with the coffee will allow different quantities of solids to be dissolved.</p> <p>Different brew times yield different flavour profiles.</p> <p>Different brew methods require varied brew times (as well as varied grind profiles):</p> <ul style="list-style-type: none"> • filter 4-6 minutes; 	<p>Identifies, through sampling different brews, the impact of brew time on flavour profiles</p> <p>Identifies the correct brew times for different brew methods</p>	

		<ul style="list-style-type: none"> • single cup 1-3 minute; • espresso 25-30 seconds <p>ACTIVITY</p> <p>Students will sample brews made with a manual dripper with 1 minute water delivery time, compared to a 2.5 minute delivery time with the following brew parameters equal:</p> <ul style="list-style-type: none"> • Coffee to water ratio. • Grind. • Temperature. 		
	4.01.04	<p>WATER TEMPERATURE</p> <p>Different water temperatures yield different flavour profiles. The recommended guideline for water temperature is 92°C – 96°C / 195°F - 205°F</p> <p>ACTIVITY</p> <p>Students will sample brews made with 85°C/185°F and 95°C/203°F with the following brew parameters equal:</p> <ul style="list-style-type: none"> • Coffee to water ratio. • Grind. • Water delivery time. 	Identifies, through sampling different brews made at different water temperatures, the impact of water temperature on flavour profiles	
	4.01.05	<p>COLD BREW</p> <p>AST note: cold brew will need to be prepared the day before</p> <p>ACTIVITY</p> <p>Sensory & technical evaluation of three brews of same coffee;</p> <ul style="list-style-type: none"> • one brewed cold (immersion/gravity) 1:16 brew ratio, • one brewed hot using reference brew parameters 1:16 brew ratio and • one using current 'common practise' of cold brew recipes... 	Evaluates through sensory and technical analysis three different cold brews of the same coffee	.

	<p>4.01.06</p>	<p>BREW TURBULENCE (AGITATION) Turbulence can impact the final cup: more turbulence results in an increased rate of extraction</p> <p>ACTIVITY Students will sample brews made with zero turbulence and controlled turbulence with the following brew parameters equal:</p> <ul style="list-style-type: none"> • Coffee to water ratio. • Grind. • Water delivery time. • Temperature. <p>AST note: Recommend using an Immersion Brewing method</p>	<p>Identifies, through sampling, the impact of brew turbulence (agitation) on extraction</p>	
	<p>4.01.07</p>	<p>WATER QUALITY Mineral concentration varies in water and it has impact on coffee brewing extraction and flavour. Flavour and aroma development will differ according to the mineral concentration in the water</p> <p>ACTIVITY Students will sample and compare brews made with water that charts inside & outside of the 'core zone' of the SCAE Water Chart: one on a low extreme, one on a high extreme, and one within the 'core zone'; with all other brewing parameters being equal</p> <p>AST Note: Supermarket waters are available within these ranges where ppm (or mg/L) may be referred to as dry residue concentration.</p>	<p>Identifies the impact of mineral concentration in water on the development of flavour and aroma in coffee Identifies the impact of mineral concentration in water on extraction</p>	<p>The SCAE Water Chart 2016</p>

	4.01.09	FILTER METHOD Different methods of filtering coffee: paper, cloth, espresso basket, metal filter (sieve)	Identifies different filter methods, their characteristics and storage requirements. Discusses the transfer of non-soluble solids and oils through different filter media using the same brewing equipment, for example, a gravity drip with cloth, paper and metal filters.	
5.0 GRINDING				
	5.01.01	ELEMENTARY ASPECTS OF COFFEE GRINDING The impact of grind size and extraction surface area, on the final drink: <ul style="list-style-type: none"> • filter 4-6 minutes, • single cup 1-3 minutes, • espresso 22-30 seconds 	Describes the impact of grind size and extraction surface area on the brew time of the final drink	The Basics of Brewing Coffee, Ted Lingle
	5.01.02	The influences of under/over extraction due to particle size.	Demonstrate what impacts an under-extracted cup (grind size, brew time) and an over-extracted cup	
	5.01.03	The impact of time on aroma in coffee cells (freshly ground coffee compared to coffee that is not freshly ground)	Describes the loss of aromas over time Compares and describes the aroma of freshly ground coffee to that ground 15 minutes earlier	

	5.02.01	GRINDER/BURR TYPES		
	5.02.02	<p>Different type of grinder burrs on the market and their most common application:</p> <ul style="list-style-type: none"> • Roller = mass production, • Flat = filter or espresso, • Conical = espresso 	Identifies the different types of grinder burrs and describes their use in coffee preparation	NBC & SCAE Grinder Research Report 2013
	5.03.01	<p>GRIND ANALYSIS</p> <p>Different methods of grind analyses:</p> <ul style="list-style-type: none"> • laser • sieve 	<p>Identifies the two different methods of grind analysis</p> <p>Describes the advantages and disadvantages of both methods of grind analysis</p> <p>Demonstrates a particle distribution chart.</p>	

6.0 EFFECTS OF ROASTING ON THE COFFEE BEAN

	6.01.01	<p>ROAST LEVEL</p> <p>The impact on flavour of different roast levels</p> <p>ACTIVITY</p> <p>Students taste a sample of the same coffee, roasted three ways (see below specs) with all other brew parameters remaining the same.</p> <table border="1"> <thead> <tr> <th>Roast cycle</th> <th>Agtron colour</th> </tr> </thead> <tbody> <tr> <td>Just after first crack</td> <td>65 to 70</td> </tr> <tr> <td>Between first and second crack</td> <td>55 to 60</td> </tr> <tr> <td>30 seconds + and after second crack</td> <td>45 to 50</td> </tr> </tbody> </table>	Roast cycle	Agtron colour	Just after first crack	65 to 70	Between first and second crack	55 to 60	30 seconds + and after second crack	45 to 50	Identifies the impact of roast level on flavour	
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