GREEN COFFEE

Green coffee

SCAE
COFFEE
DIPLOMA

Blooms Taxonomy for Professional Level

Level 5: Synthesis – Create a new point of view					
Compose	Plan	Propose	Design	Assemble	Create
Organize	Manage	Construct	Set-Up	Prepare	Write
Identify	Integrate	Produce	Theorize	Build	Systematize
Formulate					
Level 6: Evaluation – Justify a position					
Judge	Select	Verify	Choose	Score	Appraise
Review	Measure	Assess	Compute	Decide	Revise
Evaluate	Value	Test	Categorize	Estimate	

Professional Course Overview

This course is designed to build on the knowledge gained in the Green Coffee Intermediate course and prepare the student for managerial job functions found in the green coffee profession. Integration of green coffee knowledge with that in other CDS modules including sensory and roasting are also expected. Specifically students will be tested on their ability to:

- Identify key aspects of coffee botany and farm management
- Understand in detail the different stages of speciality coffee processing across the full range of methodologies found in producing countries
- Demonstrate an ability to identify a range of cup defects found globally in coffee
- Demonstrate how to analyse samples of green and roasted coffee for quality and defects
- Understand how to construct and manage green coffee portfolios in terms of volumes, cost and time with reference to the changing market price of coffee
- Understand criteria forming the cost of green coffee production and how to apply this to contract negotiation
- Demonstrate how to identify coffees based on quality and volume parameters to suit client needs
- Understanding how to assess suppliers for their ability to meet criteria outlined in third party accreditation systems

It is recommended that students have been working for a minimum of two years in a job with exposure to green coffee before taking this module, and ideally around three to five years. Pre-requisites for this module of the CDS are:

- Introduction to Coffee
- Green Coffee Foundation
- Sensory Foundation
- Green Coffee Intermediate
- Sensory Intermediate (recommended only)
- Roasting Foundation (recommended only)

The pass mark for the written test is 80%
The pass mark for the practical test is 80%

SUB CODE	KNOWLEDGE/SKILL REQUIRED	STANDARDS	REFERENCE
1.0 THEORETICAL PRINCIPLES			
1.01.01	**BOTANY** Distinguish between species and variety in coffee	L4/L5	Genetic Diversity for RAPD markers by Lashermes et al (1995) The Origin of Cultivated Coffea arabica by F. Anthony et al (2001)
1.01.02	Understand that the commercially grown cultivars of Arabica represent a small amount of the available genetic diversity	L4/L5	Genetic Diversity for RAPD markers by Lashermes et al (1995) The Origin of Cultivated Coffea arabica by F. Anthony et al (2001)
1.01.03	Have awareness of genetic analysis carried out in Arabica Coffee	L4/L5	Genetic Diversity for RAPD markers by Lashermes et al (1995) The Origin of Cultivated Coffea arabica by F. Anthony et al (2001)
1.01.04	Explain that this research has helped identify SW Ethiopia/South Sudan as the original natural distribution area of Arabica	L4/L5	Genetic Diversity for RAPD markers by Lashermes et al (1995) The Origin of Cultivated Coffea arabica by F. Anthony et al (2001)
1.01.05	Integrate knowledge of the historical path of Arabica passed around world with the development of common commercial cultivars	L4/L5	Genetic Diversity for RAPD markers by Lashermes et al (1995) The Origin of Cultivated Coffea arabica by F. Anthony et al (2001)
1.01.06	Assemble well known Arabica varieties within either the Bourbon or Typica grouping	L4/L5	Genetic Diversity for RAPD markers by Lashermes et al (1995) The Origin of Cultivated Coffea arabica by F. Anthony et al (2001)
1.01.07	Identify positives and negatives of well-known varieties		Oberthur et al Speciality Coffee (2012) p.97

SUB CODE	KNOWLEDGE/SKILL REQUIRED	STANDARDS	REFERENCE
1.01.08	Identify that some highly regarded varieties on the cupping table have limitations on the farm		Oberthur et al Speciality Coffee (2012) p.97
1.02.01	**WHY IS BOTANY IMPORTANT** Variation in Optimum Conditions By Variety	L4/L5	Oberthur et al Speciality Coffee (2012)
1.02.02	Different varieties will perform better in different micro-climates	L4/L5	Oberthur et al Speciality Coffee (2012)
1.02.03	Coffee does not grow correctly outside of optimum growing parameters	L4/L5	Oberthur et al Speciality Coffee (2012)
1.02.04	Defects likely in yield and quality		
1.02.05	The impact of climate change		ITC Exporters Guide (2011) Speciality Coffee: (2012) Oberthür et al
1.02.06	Explain that Climate change is having an impact on where species and varieties can be successfully cultivated		ITC Exporters Guide (2011) Speciality Coffee: (2012) Oberthür et al
1.02.07	Specify how climate change will impact where coffee is grown and impacts include: • Quality • Yield • Land Viability • Disease • Irrigation • Erratic rains		ITC Exporters Guide (2011) Speciality Coffee: (2012) Oberthür et al
1.03.01	**WHAT PART OF THE WORLD DOES COFFEE GROW?** Optimum growing conditions	L4/L5	Speciality Coffee: (2012) Oberthür et al
1.03.02	Discuss the impact of growing coffee at the limits of viable production – hot, cold, wet, dry on the plant	L4/L5	Speciality Coffee: (2012) Oberthür et al
1.03.03	That this leads to reduced yields and defects	L4/L5	Speciality Coffee: (2012) Oberthür et al
2.0 WORLD PRODUCTION			
2.01.01	**GLOBAL PRODUCTION STATISTICS** Evolution of production and consumption over time	L4	www.ico.org
2.01.02	Has an awareness of the changing patterns and volumes over time in global production and consumption figures	L4	www.ico.org
2.01.03	Understand that these patterns are ever evolving	L4	www.ico.org

SUB CODE	KNOWLEDGE/SKILL REQUIRED	STANDARDS	REFERENCE
2.01.04	Explain that the split of Arabica and Robusta production is dynamic	L4	www.ico.org
2.01.05	Relate this changing consumption to the evolution of consumption	L4	www.ico.org
3.0 FARMING			
3.01.01	**PLANT MANAGEMENT** Soil preservation	L4/L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Speciality Coffee: (2012) Oberthür et al
3.01.02	Identify soil preservation as an important aspect of farm management in coffee production	L4/L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Speciality Coffee: (2012) Oberthür et al
3.01.03	Distinguish between common soil preservation techniques	L4/L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Speciality Coffee: (2012) Oberthür et al
3.01.04	Relate the need for effective soil management to specific third party accreditation certification schemes	L4/L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Speciality Coffee: (2012) Oberthür et al
3.01.05	Moisture preservation	L4/L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Speciality Coffee: (2012) Oberthür et al
3.01.06	Identify moisture preservation as an important aspect of farm management in coffee production	L4/L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Speciality Coffee: (2012) Oberthür et al

SUB CODE	KNOWLEDGE/SKILL REQUIRED	STANDARDS	REFERENCE
3.01.07	Distinguish between common moisture preservation techniques	L4/L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Speciality Coffee: (2012) Oberthür et al
3.01.08	Relate the need for effective moisture management to specific third party accreditation certification schemes	L4/L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Speciality Coffee: (2012) Oberthür et al
3.01.09	Defects		Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009)
3.01.10	Plants have to be managed to prevent certain diseases		Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009)
3.01.11	This impacts on harvesting protocol		Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009)
4.0 PROCESSING METHODOLOGY			
4.01.01	**PICKING** Understand in detail the variety of methods used globally to control the quality of picked coffee cherry prior to processing	L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Speciality Coffee: (2012) Oberthür et al
4.01.02	Coffee spoils and must be processed on the day of picking	L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Speciality Coffee: (2012) Oberthür et al
4.01.03	Storage of coffee in heaps or bags should not last longer than 8 hours	L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Speciality Coffee: (2012) Oberthür et al

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4.01.04	Explain that stinkers and off ferment flavours develop when temperatures before processing reach 40 - 42°C	L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Speciality Coffee: (2012) Oberthür et al
4.01.05	Explain that there are a variety of ways both manual and mechanical to separate cherry	L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Speciality Coffee: (2012) Oberthür et al
4.01.06	Identify sugar content of cherry as being important because it has a direct impact on the potential quality of cup profile	L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Speciality Coffee: (2012) Oberthür et al
4.02.01	**WASHED PROCESS** Mucilage removal methodology		ITC Exporters Guide (2011) Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) The Importance of Water in the Wet Post-Harvest Process on the Quality of Mexican Coffee O Gonzalez-Rios et al
4.02.02	Identify differences in the washed process and relate these differences to key cost and quality and time factors specifically highlighting: • Variations in water use as a result of methodology • Differences in fermentation time between different methods of fermentation • Differences of robusta vs arabica washed process in mucilage breakdown • Differences in broad flavour profiles likely as a result of changing the method of mucilage removal		ITC Exporters Guide (2011) Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) The Importance of Water in the Wet Post-Harvest Process on the Quality of Mexican Coffee O Gonzalez-Rios et al
4.02.03	Post ferment/channel soak	L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009)
4.02.04	Identify the reasons for carrying out a post ferment/channel soak	L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009)
4.02.05	Describe the effect on coffee beans chemically and sensorially when this additional element of the washed process is carried out	L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009)

SUB CODE	KNOWLEDGE/SKILL REQUIRED	STANDARDS	REFERENCE
4.03.01	**NATURAL PROCESS** Differences in Soluble Solids as a Result of Process	L5	Espresso Coffee A. Illy R. Viani (2005) Impact of Wet and Dry Process on Green Coffee Composition and Sensory Characteristics By Leloup et al (2004)
4.03.02	Differences in chemical composition of coffee as a result of process	L5	Espresso Coffee A. Illy R. Viani (2005) Impact of Wet and Dry Process on Green Coffee Composition and Sensory Characteristics By Leloup et al (2004)
4.03.03	Explain the differences in soluble solid content as a result of the natural and washed processing methods	L4/L5	Espresso Coffee A. Illy R. Viani (2005) Impact of Wet and Dry Process on Green Coffee Composition and Sensory Characteristics By Leloup et al (2004) Espresso Coffee A. Illy R. Viani (2005) Impact of Wet and Dry Process on Green Coffee Composition and Sensory Characteristics By Leloup et al (2004)
4.03.04	Describe why the differences occur as a result of process	L4/L5	Espresso Coffee A. Illy R. Viani (2005) Impact of Wet and Dry Process on Green Coffee Composition and Sensory Characteristics By Leloup et al (2004)

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4.03.05	Explain how these changes impact on the sensory characteristics of coffees processed by different methods	L4/L5	Espresso Coffee A. Illy R. Viani (2005) Impact of Wet and Dry Process on Green Coffee Composition and Sensory Characteristics By Leloup et al (2004)
4.03.06	Defects likely in Natural Process	L4/L5	
4.03.07	Identify the following defects: • Progression of fruity cup through to full ferment • Earthy taint	L4/L5	
4.04.01	**PULPED NATURAL PROCESS** Controlling quality and characteristics	L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Speciality Coffee: (2012) Oberthür et al
4.04.02	Understand the variations in flavour profile that can be created by changing the drying pattern of pulped natural coffees	L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Speciality Coffee: (2012) Oberthür et al
4.04.03	Explain that drying patterns and control are crucial in creating quality pulped natural coffees	L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Speciality Coffee: (2012) Oberthür et al
4.04.04	Correct processing terminology	L4	ITC Exporters Guide (2011)
4.04.05	Categorise the semi washed process as having some similarities to both the pulped natural process and the mechanical mucilage removal method of the washed process The ITC comments that “It is our belief that the term semi-washed is relatively misleading” because it is applied to different processes”	L4	ITC Exporters Guide (2011)
4.05.01	**MONSOONED PROCESS** Basic process flow	L3/L4	

SUB CODE	KNOWLEDGE/SKILL REQUIRED	STANDARDS	REFERENCE
4.05.02	Explain the monsooned process in detail identifying: • Basic Process • Quality/Defect Factors • Cup Profile • Visual Identifiers	L3/L4	
4.06.01	**WET HULLED PROCESS** Basic process flow	L3/L4	Targeted Study of the Arabica Coffee Production Chain in North Sumatra (The Mandheling Coffee) By WR Susila (2005)
4.06.02	Understand it has similarities to pulped natural process in that there is retention of mucilage to varying degrees	L3/L4	Targeted Study of the Arabica Coffee Production Chain in North Sumatra (The Mandheling Coffee) By WR Susila (2005)
4.06.03	Explain the basic process flow in detail identifying: • Basic Process • Quality/Defect Factors • Cup Profile • Visual Identifiers	L3/L4	Targeted Study of the Arabica Coffee Production Chain in North Sumatra (The Mandheling Coffee) By WR Susila (2005)
4.07.01	**DRYING** Defining quality limits to the process of drying coffee prior to storage and shipment	L5	Quality of natural and washed coffee after drying on ground and with high temperature Borem et al (2012) Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Effect of Drying and Storage Conditions on the Quality of Natural and Washed Coffee By P Carteri Coradi et al (2007)
4.07.02	Explain that the quality of coffee is affected by drying patterns and temperature limits		Quality of natural and washed coffee after drying on ground and with high temperature Borem et al (2012) Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Effect of Drying and Storage Conditions on the Quality of Natural and Washed Coffee By P Carteri Coradi et al (2007)

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4.07.03	Detail that drying at a bean temperature of 60°C will reduce the sugar content of coffee and produce a poorer cupping coffee		Quality of natural and washed coffee after drying on ground and with high temperature Borem et al (2012) Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Effect of Drying and Storage Conditions on the Quality of Natural and Washed Coffee By P Carteri Coradi et al (2007)
4.07.04	Recall that coffee that is dried slower will have a more homogenous moisture content and a more uniform colour because longer drying allows the beans more time to exchange moisture and to equalise moisture content		Quality of natural and washed coffee after drying on ground and with high temperature Borem et al (2012) Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Effect of Drying and Storage Conditions on the Quality of Natural and Washed Coffee By P Carteri Coradi et al (2007)
4.07.05	Explain that this may have an impact of the longevity of coffee quality once in storage		Quality of natural and washed coffee after drying on ground and with high temperature Borem et al (2012) Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Effect of Drying and Storage Conditions on the Quality of Natural and Washed Coffee By P Carteri Coradi et al (2007)
4.08.01	**WATER USE** Effective water management is crucial to good pulping station management and resource preservation		Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Utz Certification standard
4.08.02	Discuss the effective removal of coffee pulp and mucilage to waste water management systems		Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Utz Certification standard

SUB CODE	KNOWLEDGE/SKILL REQUIRED	STANDARDS	REFERENCE
4.08.03	Coffee is washed using only clean water		Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Utz Certification standard
4.08.04	Coffee is pulped and fermented, when possible, using recycled water		Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Utz Certification standard
4.08.05	Clean water and contaminated water are separated		Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Utz Certification standard
4.09.01	**WASTE WATER MANAGEMENT** The water coming out of the wet processing unit is treated to minimize the impact on the environment, water streams and sources	L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Utz Certification standard
4.09.02	Explain the potential risks to ecosystems if untreated water from coffee processing is drained directly into the environment	L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Utz Certification standard
4.09.03	Define the common method for filtering wet processing treatment water to minimise the impact on the environment	L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Utz Certification standard
4.09.04	Explain how coffee pulp and mucilage are managed after processing, in particular reference to filtration systems	L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Utz Certification standard
4.09.05	Relate this waste management back to fertilization of farm systems	L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) Utz Certification standard
4.10.01	**GRADING** Visual defects	L4/L5	SCAA Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009)

SUB CODE	KNOWLEDGE/SKILL REQUIRED	STANDARDS	REFERENCE
4.10.02	Identify major visual defects in coffee and explain the origins of defects	L4/L5	SCAA Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009)
4.10.03	Recognise different pictures of defects and correctly name them	L4/L5	SCAA Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009)
4.10.04	Be able to use a grading protocol and accurately match physical samples with pictorial examples	L4/L5	SCAA Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009)
4.10.05	Cup Defects	L5	ITC Exporters Guide (2011)
4.10.06	Recognise key cup defects found in coffee and understand the variations in intensity of these defects	L5	ITC Exporters Guide (2011)
4.10.07	Understand the origins of non-visual defects and correctly identify them in the cup or by aroma exercise	L5	ITC Exporters Guide (2011)
4.10.08	Differentiate between a soft, riado and rio coffee from Brazil	L5	ITC Exporters Guide (2011)
4.10.09	Differentiate between differing levels of ferment in a set of samples	L5	ITC Exporters Guide (2011)
4.10.10	Grade analysis	L5	SCAA
4.10.11	Show ability to examine grades and identify issues in samples	L5	SCAA
4.10.12	Integrate knowledge of coffee grades and apply this to theoretical product specifications	L5	SCAA
4.10.13	Coffee conversion ratios	L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) ITC Exporters Guide (2011)
4.10.14	Understand that conversion ratios are important for: • purchasing negotiations with farms • understanding their capacities when building relationships • selecting the right trading partners	L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) ITC Exporters Guide (2011)

SUB CODE	KNOWLEDGE/SKILL REQUIRED	STANDARDS	REFERENCE
4.10.15	Yield by Processing Methodology Conversion	L4/L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009)
4.10.16	Different processing methods lead to different yields from red cherry to finished green coffee This means different processing methods have different cost implications	L4/L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009)
5.0 MARKETS			
5.01.01	**FUTURES MARKETS** Currencies	L3/L4	
5.01.02	Understand that coffee can be quoted in different currencies	L3/L4	
5.01.03	Make calculations between coffee pricing quoted in different prices to make cost comparisons	L3/L4	
5.01.04	Market Mechanisms	L4	theice.com ITC Exporters Guide (2011) Technical Analysis of the Futures Market (1986) by JJ Murphy
5.01.05	Explain the basic market mechanisms for working with coffee futures	L4	theice.com ITC Exporters Guide (2011) Technical Analysis of the Futures Market (1986) by JJ Murphy
5.01.06	Understand and describe the following terms: • Initial Margin • Variation Margin • Margin Call • Bank Guarantees • Bid/Ask • Against Actuals	L4	theice.com ITC Exporters Guide (2011) Technical Analysis of the Futures Market (1986) by JJ Murphy
5.01.07	Hedging	L4	ITC Exporters Guide (2011)
5.01.08	Construct a basic hedge from a given example and explain the outcome	L4	ITC Exporters Guide (2011)
5.01.09	Options	L3/L4	ITC Exporters Guide (2011)
5.01.10	Explain what options are and correctly identify different types	L3/L4	ITC Exporters Guide (2011)

SUB CODE	KNOWLEDGE/SKILL REQUIRED	STANDARDS	REFERENCE
5.01.11	Technical market analysis	L4/L5	Technical Analysis of the Futures Market (1986) by JJ Murphy
5.01.12	Define the following terms and understand how they are used to evaluate market performance: • Bollinger Band • Stochastics • Fibonaccii	L4/L5	Technical Analysis of the Futures Market (1986) by JJ Murphy
5.01.13	Risk	L4	ITC Exporters Guide (2011)
5.01.14	Be able to explain the following risk types in relation to the trading and movement of coffee: • Price • Underlying price risk • Differential risk • Quality • Physical • Performance • Currency	L4	ITC Exporters Guide (2011)
5.01.15	Deliverable growths and certified stocks	L3/L4	theice.com
5.01.16	Understand that coffee can be delivered to the terminal market	L3/L4	theice.com
5.01.17	Describe the limits to what coffee can be accepted and then explain the criteria for delivering coffee to New York and London	L3/L4	theice.com
5.02.01	**CONTRACTS** Volume management	L5	Jobin ITC Exporters Guide (2011)
5.02.02	Apply knowledge of yields and conversion ratios to building green coffee contract sizes	L5	Jobin ITC Exporters Guide (2011)
5.02.03	Explain why marketing systems at origin make it important to understand this	L5	Jobin ITC Exporters Guide (2011)
5.02.04	Price management	L4/L5	
5.02.05	Understand how to combine market levels with transportation costs	L4/L5	
5.02.06	Calculate outright prices in working examples from named price elements	L4	

SUB CODE	KNOWLEDGE/SKILL REQUIRED	STANDARDS	REFERENCE
6.0 STORAGE AND TRANSPORTATION			
6.01.01	**PRE EXPORT STORAGE** Quality retention and bagging types	L4/L5	Evaluation of the sensory and colour quality of coffee beans stored in hermetic packaging Boren et al (2012)
6.01.02	Explain the impact of using different bagging methods of coffee storage at origin on the retention of key quality cup criteria - specifically acidity and sweetness	L4/L5	Evaluation of the sensory and colour quality of coffee beans stored in hermetic packaging Boren et al (2012)
6.01.03	Outline costs, barriers and benefits of using newer bagging methods in pre export storage	L4/L5	Evaluation of the sensory and colour quality of coffee beans stored in hermetic packaging Boren et al (2012)
6.02.01	**TRANSPORT** Recognise that coffee is shipped almost exclusively by boat and in containers and that bag weights are different		Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) ITC Exporters Guide (2011)
6.02.02	Identify different bag types from pictures 21 tonnes – 30kg		Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) ITC Exporters Guide (2011)
6.02.03	Discuss the benefits and downsides of different bagging materials		Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) ITC Exporters Guide (2011)
6.02.04	Discuss merits of container variations		Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009) ITC Exporters Guide (2011)
6.02.05	Incoterms	L4	ITC Exporters Guide (2011)
6.02.06	Apply incoterms to outright coffee price calculations	L4	ITC Exporters Guide (2011)
6.02.07	Demonstrate ability to combine costs from the full coffee supply chain to calculate prices that relate to incoterms	L4	ITC Exporters Guide (2011)
6.02.08	Shipping times	L4	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009)

SUB CODE	KNOWLEDGE/SKILL REQUIRED	STANDARDS	REFERENCE
6.02.09	Apply shipping and landing times to theoretical portfolio management examples	L4	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009)
6.03.01	**STORAGE** Fumigation	L4/L5	Technologies for storage and preservation of coffee beans in India By KS Narasimhan (2006)
6.03.02	Explain that coffee can be infested by storage pests such as coffee bean weevils, especially when moisture content is high	L4/L5	Technologies for storage and preservation of coffee beans in India By KS Narasimhan (2006)
6.03.03	Identify that careful choice of fumigation method needs to be chosen, especially if coffee is certified	L4/L5	Technologies for storage and preservation of coffee beans in India By KS Narasimhan (2006)
6.03.04	Identify two key fumigants used in coffee	L4/L5	Technologies for storage and preservation of coffee beans in India By KS Narasimhan (2006)
6.03.05	Defects	L4	
6.03.06	Outline important quality criteria of a warehouse to keep coffee fresh	L4	
6.04.01	**INVENTORY MANAGEMENT** Coffee seasonality	L4	
6.04.02	Demonstrate knowledge of the basic seasonality of coffee. Specifically: • Identify broad picking seasons for key coffee growing countries • Explain the term Past Crop • Apply knowledge of freshness to cup assessment of coffees • Apply knowledge of picking season to optimum purchase times	L4	
6.04.03	Coffee volume calculations	L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009)
6.04.04	Demonstrate how to convert commonly quoted coffee weights other commonly used units of measurement	L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009)

SUB CODE	KNOWLEDGE/SKILL REQUIRED	STANDARDS	REFERENCE
6.04.05	Show how to apply these weight conversions to calculate purchase/stock levels	L5	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009)
6.04.06	EOQ (Economic Order Quantity) model	L5	Procurement Principles and Management By Baily et al (2008)
6.04.07	Define factors that can impact on the cost of storage and transport of green coffee	L5	Procurement Principles and Management By Baily et al (2008)
6.04.08	Understand how to apply a basic EOQ model to stock usage and explain limitations to the model when applying it to green coffee	L5	Procurement Principles and Management By Baily et al (2008)
7.0 CERTIFICATION			
7.01.01	**CERTIFICATION** Discuss similarities between certification	L5/L6	Key Certification Standards ITC Exporters Guide (2011)
7.01.02	Recognises there are key foundational aspects common to all certification	L5/L6	Key Certification Standards ITC Exporters Guide (2011)
7.01.03	Analyse aspects of the main coffee certification standards to identify similarities such as: • Forced labour • Working hours • Pesticide control	L5/L6	Key Certification Standards ITC Exporters Guide (2011)
7.01.04	Discuss differences between certification	L5	P.60 ITC Exporters Guide (2011)
7.01.05	Recognise key differences between the certification standards	L5	P.60 ITC Exporters Guide (2011)
7.01.06	Understand the impact of coffee farmers becoming accredited by different coffee certification schemes	L5	P.60 ITC Exporters Guide (2011)
7.01.07	Farm visits	L5/L6	
7.01.08	Demonstrate how to apply knowledge of certification key criteria to personal supplier visits	L5/L6	
7.01.09	Can integrate good farming and processing techniques with certification criteria	L5	Key Certification Standards
7.01.10	Applying certification to individual businesses	L6	Key Certification Standards

SUB CODE	KNOWLEDGE/SKILL REQUIRED	STANDARDS	REFERENCE
7.01.11	Demonstrate how to apply certification criteria to internal business strategy	L6	Key Certification Standards
8.0 DECAFFEINATION			
8.01.01	Discuss benefits and limitations of different methods	L4/L5	Coffee: Recent Developments (2001) by RJ Clarke and OG Vitzthum
8.01.02	What are the cost implications?	L4/L5	Coffee: Recent Developments (2001) by RJ Clarke and OG Vitzthum
8.01.03	What are the certification implications?	L4/L5	Coffee: Recent Developments (2001) by RJ Clarke and OG Vitzthum
8.01.04	Explain that there are different costs associated with different decaffeination methods and apply these different costs to different methods	L4/L5	Coffee: Recent Developments (2001) by RJ Clarke and OG Vitzthum
8.01.05	Understand that there are implications on which decaffeinated methods can and cannot be used according to the original green coffee certification	L4/L5	Coffee: Recent Developments (2001) by RJ Clarke and OG Vitzthum
9.0 EQUIPMENT AND MAINTENANCE			
	Not required at this level		
10.0 PLANNING AND FINANCIAL MANAGEMENT			
10.01.01	Stock management	L5	All listed references above
10.01.02	See: • Storage • Inventory Management	L5	All listed references above
10.01.03	Price control	L5	All listed references above
10.01.04	See: • Markets • Contracts	L5	All listed references above

Key Terminology

Word or Term	Description	Source
Species	A group of interbreeding individuals having some common characteristics not normally able to interbreed with other such groups e.g. Arabica or Canephora	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009)
Variety	A taxonomic rank below that of species. A plant grouping within a species which can be: • Defined by particular characteristics resulting from a given genotype or combination of genotypes • Distinguished from other plant groupings by at least one characteristic e.g. Bourbon or Typica	Speciality Coffee (2012) Edited by Oberthür et al
Cultivar	A cultivar is an assemblage of plants that (a) has been selected for a particular character or combination of characters, (b) is distinct, uniform and stable in those characters, and (c) when propagated by appropriate means, retains those characters. Specifically it is a human developed cultivated variety	wikipedia
ALFL	Amplified fragment length polymorphism	Lasmeres et al (2001)
Mulching	The practice of spreading fresh or decayed plant material on the surface of the soil with a view to decreasing weed growth, reducing evaporation losses from the soil surface and ultimately increasing soil organic matter levels	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009)
Stumping	A method of rejuvenating old coffee trees when yields decline. Stumping consists of cutting the trees with a sharp machete or saw 25 – 30cm above the level of the soil. Trees then start to produce after two years	Paraphrased from Speciality Coffee (2012) Edited by Oberthür et al
Coffee Cherry	The flesh fruit of the coffee tree	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009)
Mucilage	A slimy, jelly-like and slightly sticky layer that adheres to the parchment. It is 0.5 – 2.0mm thick and composed of pectins and sugars	Paraphrased from Espresso Coffee A. Illy & R. Viani (2005) and Speciality Coffee(2012) Oberthür et al
Parchment (pergamino)	The endocarp of the coffee fruit. It lies between the fleshy part (or pulp) of the cherry and the silver skin. Also refers to the thin, crumbly paper-like covering that is left on wet processed coffee beans after pulping and fermentation	Utz Certification List of Definitions (2009)
Silverskin	The Integument of the coffee fruit. The dried seed coat of the coffee bean. It is usually silver or copper coloured. (Note: It becomes chaff when coffee is roasted)	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009)

Centre Cut	Cleft or groove on the flat side of the bean	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009)
Washed Process	The removal of the pulp by a pulper followed by the removal of the mucilage from the parchment which can be accomplished either mechanically, by the use of chemical products, or by fermentation	Espresso Coffee A. Illy & R. Viani (2005)
Natural Process	The whole cherries are dried on patios or racks under the sun or in mechanical driers	Espresso Coffee A. Illy & R. Viani (2005)
Pulped Natural Process	The cherries are pulped and the beans in parchment dried while surrounded by the mucilage	Espresso Coffee A. Illy & R. Viani (2005)
Fermentation Tank	A specially designed tank, usually made of concrete, and often varying in shape and size with a sloped bottom. They are built for the natural fermentation and degradation of mucilage from coffee	JT
Patio	Drying grounds for parchment coffee and cherries, usually made of concrete or asphalt and built on a slight incline to help drain rainwater	Paraphrased from Wintgens
Raised (African) Bed	Flat wire or plastic mesh trays assembled on table legs … used to dry parchment coffee	Paraphrased from Wintgens
Mechanical Drier	Static or moving mechanical driers that force heated air through coffee to remove moisture until it reaches 12% total moisture	
Skin Drying	The first stage of drying parchment coffee. This may take from 6-12 hours during which time the internal moisture will be reduced from 55-60% to 20-25%	Speciality Coffee (2012) Edited by Oberthür et al
Clean Coffee	A well graded coffee, free of defects	Coffee: Growing, Processing, Sustainable Production JN Wintgens (2009)
Visual Defect	Anything that diverges from a normal bean inside the lot and that can be produced in the field or during the harvest, processing, transport or storage"	Espresso Coffee A. Illy & R. Viani (2005)
Non Visual Defect	Off tastes present in coffee only detectable by cup testing	Paraphrased from Espresso Coffee A. Illy & R. Viani (2005)
Screen Size	Coffee is graded by size using rotating or shaking screens. Screen sizes are expressed as numbers (e.g. Screen 16) or as letters (AA). Screen sizes are either measured in 64ths of one inch e.g. screen 18 (18/64 inch) or by mm against a comparable ISO scale (7.10mm). Slotted screens with oblong slits (usually 4.5mm or 5mm) are used to remove peaberries	Paraphrased from ITC Exporters Guide (2011)

Fermented	Chemical flavour caused by enzymes on the green coffee sugars. Very unpleasant odour and taste	ITC Exporters Guide (2011)
Quaker	Blighted and under developed beans – show up as roast defects. A peanutty taste	ITC Exporters Guide (2011)
Rioy or Phenolic	A taste with medicinal odour and of notes, slightly iodized phenolic or carbolic. Rio flavour is typically associated with certain Brazilian coffee (but is also encountered elsewhere). In some countries Rio flavour is considered equivalent to phenolic but there is an important difference. True phenolic beans can occur sporadically in a parcel. However, Rio is usually encountered more generally	ITC Exporters Guide (2011)
Woody	A coarse common flavour peculiar to old crop coffee. Coffee stored at low altitudes with high temperatures and humidity (as in many ports of shipment) tends to become woody rather quickly	ITC Exporters Guide (2011)
Musty or Mouldy	Caused by piling or bagging very wet parchment or by dry parchment getting wet	ITC Exporters Guide (2011)
Humectant	A substance that absorbs and retains moisture. With reference to coffee humectants are used to prevent the air in the storage space reaching dew point (100%RH)	Paraphrased from ITC Exporters Guide (2011)
Total Moisture	The combined total of free and bound moisture in coffee expressed as a percentage	JT
Water Activity (aw)	Water activity is a measure of the energy status of the water in a system. Water activity is defined as the ratio of the vapour pressure of water in a material (p) to the vapour pressure of pure water (po) at the same Temperature aw = p/po = ERH (%) / 100	Decagon Devices
Incoterms	A series of pre-defined three letter commercial terms published by the International Chamber of Commerce (ICC) that are widely used in International commercial transactions	ICC Wikipedia Page
OTA	Ochratoxin A is a mycotoxin produced by species of fungi and is a known carcinogen. Roasting reportedly destroys between thirty to over ninety percent of OTA present in green coffee - and the residual OTA in roasted coffee is readily extractable in aqueous solution. This means that poor hygiene controls in the production of green coffee leading to OTA contamination can have a negative public health impact on the ultimate consumer	http://www.coffee-ota.org/
Cash Market	Participants buy and sell physical green coffee that will be delivered either immediately or promptly. The cash transaction therefore involves the transfer of ownership of a specific lot of a particular quality of physical coffee	ITC Exporters Guide (2011)
Futures Market	Participants buy and sell a price for a standard quality of coffee. The futures transaction centres around trading a futures contract based on a physical coffee at a price determined in an open auction – the futures market	

Certified Stocks	A recorded volume of coffee bags that have been inspected by a designated official and determined to be of a quality that meets the Futures Exchange standards. Certified stocks are kept in designated warehouses	
Risk	A variety of physical and financial risks that can affect the quality or price of coffee. See ITC Exporters Guide (2011) for more detailed definitions	ITC Exporters Guide (2011)
Hedge	Hedging is a trading operation that enables management of the risks posed by unforeseen price movements. Hedging allows one to offset price risk through opposing but matching transactions in both physicals and futures	ITC Exporters Guide (2011)
Option	A commodity option gives the holder the right to buy, but not the obligation, to purchase (a call) or sell (a put) on an underlying futures contract at a specific price within a specified period of time	Technical Analysis of the Futures Market (1986) by JJ Murphy
Stochastic	A price momentum indicator where it is determined where the most recent closing price is in relation to the price range for a given period	Technical Analysis of the Futures Market (1986) by J.J. Murphy
Bollinger Band	Bollinger Bands® are volatility bands placed above and below a moving average. Volatility is based on the standard deviation, which changes as volatility increases and decreases. The bands automatically widen when volatility increases and narrow when volatility decreases	http://stockcharts.com/
Support & Resistance	Support is a level or area on the chart under the market where buying interest is sufficiently strong to overcome selling pressure. As a result, a decline is altered and prices turn back up again. Resistance is the opposite of support and represents a price level or area over the market where selling pressure overcomes buying pressure and a price advance is turned back	Technical Analysis of the Futures Market (1986) By JJ Murphy
Buying Conversions	Below are useful buying calculations when converting coffee offers to different units of volume and currency: • c/lb to $/MT = x 22.046 • c/lb to $/KG = x 2.204 • c/lb to $/50 kg = x 1.1023 • $46 to c/lb = No calculation needed. '$' become 'c' • $46 to $50 kg = x 1.1069 • $50 kg to $MT = X 20	Ludovic Maillard
Certification	A guarantee that specific rules and regulations of voluntary standards are met in a certain environment (e.g. individual producer, producer group, co-operative, or even region)	ITC Exporters Guide (2011)
Caffeine	A bitter alkaloid compound present in the coffee bean that has a dose dependent action on the human body	
Decaffeinated Coffee	A coffee where the majority of caffeine has been removed by physical process and solvent medium. Specifically in EU countries there has to be a maximum concentration of 0.1% caffeine related to the dry mass	

References

Core Texts (Recommended for Students and Trainers)

1. **Espresso Coffee: The Science of Quality (2005) Edited by A. Illy and R. Viani**
2. **Coffee: Growing, Processing, Sustainable Production (2009) Edited by JN Wintgens**
3. **The Coffee Exporters Guide (2011) by ITC**
4. **Arabica Green Coffee Defect Handbook by SCAA**
5. **Speciality Coffee: Managing Quality (2012) Edited by Oberthür et al**
6. **The Coffees Produced Throughout the World (1992) by P Jobin**

Additional Reading (Recommended for Trainers)

7. Coffee: Recent Developments Edited By RJ Clarke And OG Vitzthum (2001)
8. Genetic Diversity For RAPD Markers Between Cultivated And Wild Accessions Of Coffea Arabica by Lashermes et Al (1995)
9. The Origin Of Cultivated Coffea Arabica L. Varieties Revealed By AFLP And SSR Markers by F Anthony et Al (2001)
10. The Importance Of Water In The Wet Post-Harvest Process On The Quality Of Mexican Coffee by O Gonzalez-Rios et All
11. Impact of ‘‘ecological’’ post-harvest processing on the volatile fraction of coffee beans: I. Green coffee by By O Gonzalez-Rios et All (2006)
12. Impact Of Wet And Dry Process On Green Coffee Composition And Sensory Characteristics by V Leloup et Al (2004)
13. Targeted Study of the Arabica Coffee Production Chain in North Sumatra (The Mandheling Coffee) by WR Susila (2005)
14. Effect Of Drying And Storage Conditions On The Quality Of Natural And Washed Coffee by P Carteri Coradi et Al (2007)
15. The Importance Of The Resting Period In The Coffee Grain Aspect And Beverage Quality By MY Rendon et Al (2010)
16. Quality Of Natural And Washed Coffee After Drying On Ground And With High Temperature. By Borem et Al (2012)
17. Evaluation Of The Sensory And Colour Quality Of Coffee Beans Stored In Hermetic Packaging by Borem et Al (2012)
18. Technologies for storage and preservation of coffee beans in India by KS Narasimhan (2006)
19. Technical Analysis Of The Futures Market by JJ Murphy (1986)
20. Procurement Principles And Management by Baily et Al (2008)