



## **ROASTING MODULE**

The Roasting modules teaches about the roasting process, including roast cycle, roast levels, identifying defects, the physical changes that beans undergo during the roasting process, as well as workspace management and lean production.

**Roasting** can be studied at three different levels within the SCA Coffee Skills Program:

### **Roasting Foundation**

The Roasting Foundation course gives the learner an understanding of the roasting process, including the physical changes that take place during the process, and how to control sensory aspects of the coffee by roasting light or dark. Learners will also gain an understanding of the basic structure of the roasting machine, and general maintenance and fire prevention. Practical learning objectives and activities prepare the learner to follow instructions, given by the trainer, for three different roasts and record relevant data and observations per roast using a suitable roast log. A written exam tests theoretical knowledge based on Foundation course learning objectives.

<b>Required Prerequisites</b>	None	<b>Recommended Prerequisites</b>	Introduction to Coffee	<b>Delivery Method</b>	In-person, distance learning or as a combination of both.	<b>Minimum Length</b>	7 hrs	<b>Required Exams   Passing Scores</b>	Written exam   60%
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### **Roasting Intermediate**

The Roasting Intermediate course builds upon the introductory concepts of the Foundation course. It is ideal for someone who has roasting and desires to gain a deeper understanding of the roast profile, how the profile relates to color, the relationship between roast profile and sensory expression, and the impact of development time. Learners will further explore the physical and chemical changes as well as basic thermodynamics and heat transfer that occurs during the roast. Thereafter there will be an introduction to sample roasting and a review of safety and maintenance protocols in the roasting plant. A written exam tests intermediate course knowledge while a practical exam assesses the learner's ability to roast correctly and remove the coffee at the correct color using a reference, while accurately completing the roast log form.

<b>Required Prerequisites</b>	None	<b>Recommended Prerequisites</b>	Introduction to Coffee, Roasting Foundation	<b>Delivery Method</b>	In-person or as a combination of in-person for practical elements and distance learning for theory.	<b>Minimum Length</b>	21 hrs	<b>Required Exams   Passing Scores</b>	Written exam   70% Practical exam   70%
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### **Roasting Professional**

The Roasting Professional course is designed to build upon the concepts and skills introduced in the Roasting Intermediate course. Learners will gain advanced skills in profile development and sensory analysis evaluation. This course dives deep into a wide range of topics including control and color matching within different and specified time limits, use and configuration of roast profile software, molecules involved in browning reactions, gas formation during roasting process, chemical causes of color and impact on solubility, visual identification of roasting defects, blending and quality control as well as an exploration of production options to help meet differing customer preferences. A written exam confirms professional course knowledge while a practical exam assesses the learner's ability to roast to different development time targets within narrow limits, score a roast color visually, identify common roast defects through cupping and finally distinguish between small and large differences in a roast profile to simulate production quality control processes.

<b>Required Prerequisites</b>	Roasting Intermediate	<b>Recommended Prerequisites</b>	Green Coffee Intermediate and Sensory Skills Intermediate	<b>Delivery Method</b>	In-person or as a combination of in-person for practical elements and distance learning for theory	<b>Minimum Length</b>	21 hrs	<b>Required Exams   Passing Scores</b>	Written exam   80% Practical exam   80%
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**ROASTING COURSES – TOPIC OVERVIEW**

Foundation	Intermediate	Professional
<p><b>ROASTER BASICS</b> Terminology Roaster Elements Controlling the Roast</p> <p><b>ROASTING PROCESS</b> Physical Changes Producing and Using a Roast Profile Critical Events Transformational Changes Impact of Heat Taste and Aroma Using a Roast Log</p> <p><b>SAFETY AND MAINTENANCE</b> Safety in Roasting Plant Roaster Cleaning</p>	<p><b>ROAST PROFILE</b> Measurements and Variables Supporting the Roast Profile Heat and Temperature's Impact on the Profile Documenting the Roast Color - Measuring and Importance Roast to Color Sensory Analysis - Impact on Flavor and Color Recognizing and Documenting Cupping for Green vs for Profile Relationship between Development Time and Flavor Relationship between Profile and Roast Color Terminology</p> <p><b>PHYSICAL CHANGES</b> Chemical and Physical Changes during Roasting Rate of Rise (RoR) Basics and Projection Changes in Weight and Volume Basics, Calculation and Comparison Changes in Size, Density and Moisture</p> <p><b>ROASTER ELEMENTS</b> Drum and Fluid Roasters Basic of Thermodynamics of Coffee Roasting Heat Transfer</p> <p><b>SAMPLE ROASTING</b> Purpose of Sample Roasting Program Types of Sample Roasters Process and Sensory Evaluation of Samples</p> <p><b>SAFETY AND MAINTENANCE</b> Preventive and Maintenance Protocols Health and Safety Green and Roasted Coffee Storage Conditions</p>	<p><b>GREEN COFFEE</b> Analysis of Physical Attributes Chemistry of Green Coffee - Major Chemical Components and Causes of Ochratoxins (OTA) and Health Risks</p> <p><b>THERMODYNAMICS IN COFFEE ROASTING</b> Heat Transfer Modes Heat Diffusion - Basics, Diffusion from Outer to Inner Bean, Water's Role and Effect on Roast Defects</p> <p><b>PHYSICAL CHANGES</b> Expansion - Glass Transition, Internal Pressure, Porosity and Structural Degradation Changes in Extractability and Solubility - Roast Degree and Speed Effects</p> <p><b>CHEMICAL CHANGES</b> Chemical Reasons for Color Change Measuring Roast Color Effect on Solubility Acidity and Bitterness Changes Bitterness Changes Effect on Aromatics Acrylamide Formation</p> <p><b>SENSORY ANALYSIS</b> Evaluation of Development Time Modulations Quality Control Methodology</p> <p><b>WHOLESALE AND RETAIL BUSINESS</b> Customer Preferences Price calculations - Cost of Roasted Coffee, Profit Margin and Batch Size Requirements</p> <p><b>ROASTERY MANAGEMENT</b> Roastery Production Design and Optimization Supply Chain Management Monitoring Roasting Process Blending Roast Degree's Effect on Cleaning and Maintenance</p>