

## Level II: Espresso Machine Repair

This course has been a long time in coming to fruition. After several years of dialog in determining how to approach the topic of espresso machine repair, we are now ready to offer this class.

### Prerequisite

Students entering this course must either take the DMM-1 course or test out of the course. See the DMM link for more information.

### Topics Covered

Level II course is on basic electrical and mechanical theories and practical diagnostic methods for troubleshooting and repairing espresso equipment. Equal attention is given to technical and practical instruction. Because each super-automatic espresso machine is designed differently, this course covers the basics of espresso machine principles. For more in-depth knowledge of a specific machine, students need to contact their vendor for specific training. Topics include:

- Product Knowledge
  - Espresso defined
  - Milk chemistry
  - Espresso machine cleaning
- Water
  - Basics, testing, treatment fundamentals
  - Water softening
  - Reverse Osmosis
  - Cross Flow Filtration Using RO Membranes
  - Sediment Filtration
  - Activated Carbon Filtration
  - Treatment Option and Troubleshooting
- Principles of Grinding
  - Espresso grinder and burr grinder
  - Effects of Extraction
  - Grinder Dose Testing & Adjusting
  - Adjusting the Grind and Dose
  - Grinder Troubleshooting and Maintenance
- Principles of the Espresso Machine
  - Types and Basic Operating Theory
  - Espresso Systems
  - Pressurization of Water
  - Water Control Systems
  - Measuring (aka Dosing) Flow
  - Heating

- Electromechanical Systems
- Troubleshooting
  - Using the Big Three Diagnostic Approach
  - Troubleshooting - General
  - Troubleshooting - Components
  - Preventative Maintenance

This class is offered in a face to face seminar setting OR online. Both formats are taught / facilitated by a coffee industry recognized trainer and are limited to 12 students.

The face-to-face seminar format is:

- 1 week in length with 40 hours of instruction, starting on a Monday and ending on a Friday
- Class format is lecture in the mornings and hands-on activities in the afternoon

The online format is:

- 4 weeks in length with 6-12 hours per week for class participation
- “Anytime, anywhere” learning format
- Format will allow for select group interaction and problem solving to be done in real time and/or in group discussion forums
- There is a required weekly web-based meeting with phone connection. This means the individual needs a computer with internet access AND a phone for the call.

## Objectives

Upon completing this course and passing the certification exam with a 75% or better score, the learner will:

- Identify the principles of coffee grinding and have a working knowledge of espresso preparation
- Recognize how grinding effects extraction and be able to troubleshoot common problems
- Understand espresso brewing, heating systems, and filling systems
- Identify the "Big Three" and diagnostic approaches to espresso machines
- Distinguish issues relating to pressure vessels and pumps as they relate to espresso machines, including maintenance, repair, and troubleshooting
- Differentiate the four classes of espresso machines
- Describe a troubleshooting methodology for electromagnetic flow meters
- Illustrate the fundamentals of electronic and electromechanical devices found in espresso machines
- Recognize the super automatic espresso machine and know the programmable options

- Explain the principles of the Four M's and how they are critical to producing quality espresso
- Define the underlying chemistry of milk foaming and how to store dairy products safely
- Recognize the basics of water chemistry, including testing and treating Detect and identify problems dealing with water treatment systems

## **Target Audience**

This course is targeted at equipment service technicians currently working in the field who are looking to upgrade their knowledge and skills in order to earn Industry Certification. Upon completion and certification they should be ready to work for a beverage industry service provider under minimal supervision.

For students interested in a vocation in equipment maintenance within the specialty beverage industry, this course prepares them to be an apprentice. They should be under experienced supervision as an apprentice for 2000 hours.

## **Certification**

Candidates who have successfully completed the course receive a certificate from SCAA, Specialty Coffee Association of America, and El Camino College. Graduates are also given a BEST Certified patch that can be worn on their uniform.