Diploma in Distilling

Module 1 Syllabus

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1	Diploma in Distilling Module 1 Syllabus	Syllabus Portfolio Manager	Chair of Board of Examiners	10/06/2025

UNIT 1: CEREALS

Candidates are required to have an in-depth understanding of the following:

Barley

1. Understand how barley is cultivated across the world and the impact of barley breeding programmes.
2. Sketch a barley grain – identify the key elements and understand their importance to a distillery.
3. Create a specification for the purchasing of barley for malting.

Introduction to Malting

1. Understand distillers' involvement in the supply chain, from barley breeding to the delivery of specified malt.
2. Understand how distilling malt specifications are created, and how they are linked to barley quality.
3. Interpret and understand the key methods of analyses used for specifying malting barley and finished malt.

Malting for Malt and Grain Distilling

1. Demonstrate how barley is prepared for malting, and the effect on malt quality of screening and grading it.
2. Examine the key physiological and biochemical changes in barley during the steeping process.
3. Examine the key physiological and biochemical changes in barley during the germination process.
4. Understand the principles of malting loss and how it affects potential spirit yield.
5. Examine the physiological and biochemical changes in malt on-kiln and understand their effect on malt quality.
6. Demonstrate how peated malt is made and compare different styles of peated malt.

Other Cereals

1. Describe other common cereals used in spirit production and why they are used.
2. Understand the cereals' physiology, biochemical composition, and suitability for use in distilling.

UNIT 2: OTHER SOURCES OF EXTRACT

Candidates are required to have an in-depth understanding of the following:

Molasses

1. Demonstrate knowledge of sugar cane and sugar beet cultivation.
2. Describe sugar cane and sugar beet harvesting and processing methods for sugar/molasses production.
3. Differentiate between molasses sources.
4. Demonstrate knowledge of the use of molasses in distilling.

Grapes

1. Describe the suitability of Vitis vinifera grape varieties for brandy production.
2. Demonstrate knowledge of the key stages of grapevine and berry development in the vineyard.
3. Describe the impact of different viticulture practices on grape quality.
4. Demonstrate an understanding of the importance of grape ripening parameters used for harvest time estimation and quality control.

Agave

1. Examine the process of cultivating agave.
2. Understand the key stages in the cultivation process.
3. Evaluate the harvesting process.

UNIT 3: Water

Candidates are required to have an in-depth understanding of the following:

Basic Quality Requirements of Water

1. Review the uses of water in the distillery.
2. Explain the various forms of water treatment available.
3. Describe a typical specification for distillery water and explain how it is important to spirit production.
4. Examine the potential sources of nutrition delivered in water.

Basic Quality Requirements of Water

1. Review the uses of water in the distillery.
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UNIT 4: MATERIALS HANDLING

Candidates are required to have an in-depth understanding of the following:

Malt Delivery and Handling

1. Describe intake inspection tests, and their importance.
2. Understand the reason for a Certificate of Analysis
3. Identify the essential malt storage requirements.
4. Describe the operation of malt intake, handling, and storage (including cleaning, screening, and dust handling).
5. Understand dust explosions and their prevention.
6. Understand the handling of other cereals.

Milling

1. Identify the key objectives of milling.
2. Describe the fundamental principles of producing a grist.
3. Describe mill operation and its importance, including:

a. Compression and shear
b. Factors controlling the efficiency and capacity of the mill
c. Crushing and malt friability, its effect on the mill and downstream processes.

4. Describe the design and operation of the various mill types: dry and wet mills, hammer mills, hydro mills.
5. Compare mill types and their selection criteria.
6. Examine the specifics of mill grist analysis and wort separation.
7. Describe milling safety considerations and safe practices.

Molasses Handling

1. Describe molasses specifications for distilling.
2. Identify the impacts of molasses parameters on fermentation and distilling.
3. Describe the molasses handling process in distilling.

UNIT 5: CEREAL WORT PRODUCTION

Candidates are required to have an in-depth understanding of the following:

Malt Mashing

1. Understand and summarise the biochemical pathways and reactions behind the mashing process.
2. Use your understanding of the mashing process to choose and use typical mashing equipment.
3. Calculate the mash tun extract and grain weights required for a given system.

Cereal Mashing

1. Understand the different types of cereal cooking processes and the reasons for using them.
2. Apply your understanding of the different types of cooking equipment to conduct a cereal mash.
3. Select and use the correct exogenous enzymes for unmalted cereals mashing.

Wort Properties

1. Understand how typical wort specifications for malt and non-malt wort impact final spirit quality.
2. Review wort analysis methods and their purpose in managing spirit quality.

Wort Separation

1. Understand the main options for wort separation and be able to sketch each option.
2. Contrast the main attributes and benefits of each technology.
3. Understand oxygenation and cooling of wort.
4. Describe the process of spent grain removal.

UNIT 6: NON-CEREAL WORT PRODUCTION

Candidates are required to have an in-depth understanding of the following:

Molasses Wort Production

1. Identify and describe molasses pre-treatment methods.
2. Describe the molasses mashing process, and typical parameters.
3. Identify issues with mashing molasses wort.

4. Explain the use of dunder in molasses mashing.
5. Understand the need for pH and sugar content adjustments and for the addition of nutrients in molasses wort production.

Grape Must Production

1. Describe the pressing process and the impact it can have on final brandy quality.
2. Understand the key factors in delivering good must yield.
3. Describe the co-products of pressing and their uses.
4. Understand the treatments used in must production.
5. Understand key additions and their benefits and issues.
6. Describe a typical must composition and why it might vary.

Agave Mosto Production

1. Describe the treatments and processing of mosto production.
2. Identify the key steps and their benefits and issues.
3. Understand a typical mosto composition and why it might vary.

UNIT 7: YEAST BIOCHEMISTRY

Candidates are required to have an in-depth understanding of the following:

Yeast Properties and Physiology

1. Describe the features that are unique to yeasts and how their structure and cellular functions differ from the cells of other organisms.
2. Draw a diagram showing the key features of a typical yeast cell.
3. Describe the functions of the major organelles.
4. Understand how yeast cells replicate and multiply.
5. Understand the genetic makeup of distilling yeast, and describe some of the genetic methods used to identify individual strains.
6. Understand the nutritional requirements of yeast.
7. Describe the desirable features of a distilling yeast.

Yeast Biochemistry

1. Describe the carbohydrate nutrients that distilling yeasts are able to utilise.
2. List which carbohydrates distilling yeast cannot utilise.
3. Describe how carbohydrates are transported into yeast cells.
4. Understand how metabolism is controlled to explain the ordered uptake of carbohydrates and other nutrients.
5. Draw diagrams showing the individual steps and name the intermediates in the Embden Myerhof-Parnas pathway (glycolysis), including the reactions in which energy is consumed and generated and reducing power is formed.
6. Discuss how pyruvate is further metabolised under repressed and de-repressed conditions to form alcohol and CO2 or other products of metabolism.

7. Describe the ways in which a proportion of pyruvate is used by yeast cells to provide precursors for biosynthetic pathways such as fatty acids and sterols.
8. Understand the roles of oxygen and fermentable sugars in the regulation of yeast metabolism and demonstrate the consequences for energy generation.
9. Define cellular redox control and demonstrate with drawings how this is balanced when metabolism is derepressed.
10. Explain how redox control is controlled under repressed conditions and give examples of products of metabolism which have redox-balancing functions when metabolism is repressed.
11. Demonstrate with drawings the principal steps in the pentose-phosphate pathway and discuss its role in metabolism in distilling yeast.
12. Show how a proportion of the carbohydrates taken up by yeast in fermentation are diverted into the formation of glycogen and trehalose and explain the functions of these products of metabolism.

UNIT 8: FERMENTATION

Candidates are required to have an in-depth understanding of the following:

Yeast handling in the Distillery

1. Understand the principles of commercial yeast production.
2. Compare and contrast the five sources of yeast available to the distiller and the advantages and dis advantages of each.
3. Establish good handling practice within the distillery, including storage temperature and shelf life.

Fermentation Process

1. Sketch a typical distillery fermenter and explain the key elements.
2. Examine the different stages of distillery fermentation and discuss the impact on final spirit.
3. Describe the biochemical changes throughout a fermentation.
4. Describe the issues that alcohol sensitivity presents to a distillery fermentation.

Non-cultured fermentations

1. Explain the advantages and disadvantages of spontaneous and controlled fermentations.
2. Review the types of yeast used in brandy base wine fermentations.
3. Describe the key elements of a brandy base wine fermentation and their value to the final spirit.
4. Identify the microbial spoilage organisms in molasses.
5. Describe the means of control of spoilage organisms.
6. Describe the impacts of spoilage organisms on the fermentation process.
7. Describe the impacts of spoilage organisms on rum flavour.
8. Review the types of yeast used in agave fermentations.
9. Describe the key elements of an agave fermentation and their value to the final spirit.