

TECHNOLOGY AND CONTROL IN BEER AND DISTILLED BEVERAGES INDUSTRY

(IVth Year of study, VIIIth Semester)

Credit value (ECTS): 5

Course category

Domain (Compulsory)

Course holder:

Prof. PhD. Valeriu V. COTEA

Discipline objectives (course and practical works)

The "Technology and Control in Beer and Distilled Beverages Industry" course aims to provide students with updated information about technologies for obtaining beer and distilled beverages, the specific equipment used in breweries and alcohol producing industries from fruits and cereals, the authorized technological practices used in the stabilization and bottling of alcoholic beverages, legislation, and the usual analytical methods used in order to determine beer and distilled beverages quality, and also other information that can help prepare future professional engineers in the food industry.

Contents (syllabus)

Course (chapters/subchapters)
1. Introduction in brewing technology. The history of beer. Main types of beer. Beer consumption worldwide and in Romania.
2. Raw materials used in brewing and malting industries.
3. Malt obtaining technology.
4. The obtaining of must. The chemical composition of the beer.
5. The fermentation technology used for beer production. Technological processes.
6. Clarification, stabilization and the bottling of beer
7. Classification of distilled spirits. The main types of distilled beverages.
8. Raw materials used to obtain agricultural and horticultural distillates.
9. The technology for obtaining refined alcohol.
10. Continuous and discontinuous distillation technologies.
11. The main drinks obtained from refined alcohol.
12. The main beverages obtained by distillation.
13. Maturation and aging of distillates.
14. The technology for obtaining aged wine distillates (Cognac, Brandy, Vinars)

Practical works
1. Safety rules of and fire protection in the Laboratory of Enology. Description of laboratory equipment and utensils used in the analysis of beer and distilled beverages.
2. Determination of soluble solids in the raw materials used for alcoholic fermentation by refractometry and areometry. Determining the potential alcoholic strength.

3. Preparing samples for beer analysis; decarbonization. Determination of the concentration of carbon dioxide in beer.
4. Determination of beer alcoholic content.
5. Determination of primitive extract of must and dry extract in beer.
6. Determination of total acidity of beer by potentiometric and colorimetric methods. Determination of the real acidity of beer (pH)
7. Determination of beer "bitterness" by spectrophotometric methods.
8. Determination of alcoholic content in distillates.
9. Determination of methanol in alcoholic beverages.
10. Carbonyl compounds that are found in distilled liquors. Determination of the distilled acetaldehyde.
11. Determination of total phenolic compounds, Folin-Ciocalteu index and total anthocyanin content of alcoholic beverages by spectrophotometric methods.
12. Determining the color of distillates by Cie-LAB 76 method and performing a computer simulation of color.
13. Determination of aromatic profile of beers through sensory analysis (beer tasting)
14. Test

Bibliography

1. Banu C. (coordonator) ș. a., 1999 – *Manualul inginerului de industrie alimentară, vol. II*, Editura Tehnică, București.
2. Cotea V. V., 2014 – *Note de curs*.
3. Kunze W., 1999 – *Technology brewing and malting*, VLB, Berlin.
4. Mudura Elena, 2004 – *Tehnologii fermentative – tehnologia berii*. Indrumator de lucrări practice, Editura Risoprint, Cluj-Napoca.
5. Țenu I., 1997 – *Tehnologii, procedee, mașini și instalații pentru industrializarea produselor vegetale, Partea I – Tehnologii și procedee*, Editura Bolta Rece, Iași

Evaluation

Evaluation form	Evaluation Methods	Percentage of the final grade
Exam	examination	60%
Appreciation of the activity during the semester	Course attendance	10%
	Oral assessment during the semester, verification tests and final laboratory test.	30%

Contact

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