OENOLOGY I

(Specialization Horticulture, 3rd Year of study, 2nd Semester)

Credits (ECTS): 4

Course category: Specialized discipline

Course holder: Prof. Valeriu V. COTEA, PhD

Objectives of the discipline:
The oenology course aims to provide students with up-to-date information related to primary vinification, authorized oenological practices, stabilization and conditioning of wines, viticulture legislation, usual and specific analyzes of wines and derived products, other information to help the professional training of the future horticultural engineer.

Contents (syllabus)

Course (chapters/subchapters)
1. INTRODUCTORY NOTIONS
1.1. Definitions. The object and content of Oenology. Statistics on wine production around the world.
2. WINE BUIDINGS AND VESSELS.
2.1. Wine buildings. Organization of the winery complex.
2.2. Wine vessels. Classification of wine vessels. Types of wine vessels.
3. GRAPES USED AS RAW MATERIAL IN THE WINE INDUSTRY
3.1. Constituent parts of the grape and the correlation between them. The chemical composition of grapes. The phases of grape ripening and the evolution of their composition.
3.2. Establishing the optimal moment for picking. Overripening of grapes. Botrytis of grapes. Evaluation of grape production and scheduling of picking. Manual harvest of grapes. Mechanized harvesting.
4. GRAPE PROCESSING TECHNOLOGY AND OBTAINING THE MUST
4.1. Transport, reception and unloading of grapes for processing. The crushing and destemming of the grapes. Treatments applied to the unpressed must. Separation of must from solids. Yield of must.
5. CHEMICAL AND BIOLOGICAL COMPOSITION OF THE MUST.
5.1. The chemical composition of the must. Oses from grapes, must and wine. Grape juice, must and wine. Pectic substances, gums and mucilaginous substances from must. Acids from must. Nitrogenous substances from grapes, must and wine. Tanning substances in must and wine. Coloring substances from must and wine. The odorous substances in must and wine. Mineral substances in must and wine.
5.2. Biocatalysts of must and wine. Vitamins from grapes, must and wine. Enzymes that come from grapes. Enzymes produced by microorganisms. Enzymes from industrial enzyme preparations
6. MUST PROCESSING TECHNOLOGY
6.1. Must processing technology. Assembly and blending of musts. Conditioning of the must. Treatments applied to the must before fermentation.
6.2. Composition corrections applied to must and wine. Correction of the sugar content of the must by adding concentrated must. Correction of the sugar content of must by adding food sugar. Correction of the sugar content of must by partial concentration. Increasing the acidity of must and wine.
7. ANTISEPTICS AND ANTIOXIDANTS USED IN THE WINE INDUSTRY.

7.1. Antiseptics and antioxidants used in the wine industry. SO_2 states and changes in wines. SO_2 actions in must and wine. The advantages and disadvantages of using SO_2 in winemaking. The forms in which SO_2 is used. The moment of sulfiting, the doses and the administration technique of SO_2. The use of sorbic acid in winemaking. The use of ascorbic acid in winemaking. The use of dialkyl pyrocarbonates in winemaking.
8. FERMENTATION AND MACERATION IN WINE PRODUCTION TECHNOLOGY
8.1. Alcoholic fermentation of must. Filling fermentation vessels with must and equipping them. Development phases of alcoholic fermentation. Spontaneous fermentation. Induced fermentation. Technological variants of must fermentation. Fermentation supervision and management. Fermentation of must in continuous flow.
8.2. Fermentation and maceration in wine production technology. Maceration in the technology of obtaining white wines. Maceration - fermentation in the technology of red wine production. Maceration fermentation in static vessels. Maceration fermentation in dynamic vessels (rotating tanks) and in continuous flow. Carbonic maceration. Red vinification by thermal maceration.
9. MALOLACTIC FERMENTATION
9.1. Development of malolactic fermentation. The factors on which malolactic fermentation depends.

Practical activity
1.Protection of practical activities in the laboratory
2. Establishing the optimal time to harvest grapes.
3. Density and relative density of must and wine.
4. Evaluation of the relative content of sugars in must
5. Determination of the alcohol concentration in wine and distillates
6. Determination of the total dry extract in must and wine.
7. Determination of total acidity in must and wine.
8. Determination of volatile acidity in wines.
9. Determination of real acidity and buffer effect at wine.
10. Determination of tartaric acid in musts and wines.
11. Determination of reducing sugars in musts and wines
12. Conditioning and stabilization of wine.
13. Determination of the chromatic characteristics of red wines.
14. Test

Bibliography

1. Cotea, V.V., Note de curs.
2. Pomohaci, N., Gheorghiță, M., Iuoraş, R., Stoian, V., Cotrău, A., Cotea, V.V.,1990, Oenologie, Editura Didactică şi Pedagogică, Bucureşti.
3. Pomohaci, N., Stoian, V., Gheorghița, M., Sîrghi, C., Cotea, V.V., Năməloşanu, I., 2000, Oenologie. Volumul 1: Prelucrarea strugurilor şi producerea vinurilor. Editura Ceres, București.
4. Pomohaci, N., Cotea, V.V., Stoian, V., Năməloşanu, I., Popa, A., Sîrghi, C., Antoce, Arina , 2001, Oenologie. Volumul 2: Îngrijirea, stabilizarea şi îmbutelierea vinurilor. Construcții şi echipamente vinicole, Editura Ceres, București.
5. Cotea, V.V., Cotea V.D., 2006, Tehnologii de producere a vinurilor, Editura Academiei Române, București.
6. Cotea, V.D., Zanoaga, V.C., Cotea, V.V., 2009, Tratat de Oenochimie, vol. I, vol. II, Editura Academiei Române, București.
7. Cotea, V.V., Zanoaga, V.C., Cotea V.D., 2010, Oenologie. Construcții, vase şi utilaje vinicole, Editura Academiei Române, București, 2010.

Evaluation

Evaluation form	Evaluation Methods	Percentage of the final grade
Final exam	Written / oral examination	60
Evaluation of the activity during the semester	Written and oral assessments during the semester	40

Contact

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