Oenology I (HORTICULTURE, 3RD YEAR OF STUDY, VI TH SEMESTER)

Credit value (ECTS):4

Course category:
Speciality course (mandatory)

Course holder:
Prof. Valeriu V. COTEA

Discipline objectives (course and practical works)
The oenology course aims to provide students with up-to-date information related to primary vinification, authorized oenological practices, stabilization and conditioning of wines,wine legislation, basic and specific analyzes of wines and derived products, other information that help train the future horticultural engineer.
Specific objectives
- Knowledge, understanding and specialized use of innovative concepts in the wine sector.
- The ability to organize and manage technological processes in the wine industry.
- The ability to understand and interpret the physico-chemical and biological phenomena in oenology.
- Acquiring knowledge on primary winemaking, choosing materials and solutions technology with a price / quality ratio as convenient as possible.

Contents (syllabus)

Course (chapters/subchapters)
INTRODUCTORY NOTES
Definitions. The purpose and content of Oenology. Statistics on wine production worldwide.
WINE CONSTRUCTIONS AND VESSELS
Wineries. Organization of the wine complex.
Wineries. Classification of wine vessels. Types of wineries.
THE GRAPES USED AS RAW MATERIAL IN THE WINE INDUSTRY
The constituent parts of the grape and the correlation between them. Chemical composition of grapes. The phases of grape ripening and the evolution of their composition.
Determining the optimal time for picking. Grape overmaturation. Grape noble rot. Evaluation of grape production and programming of the harvest. Manual harvesting of grapes. The mechanized harvesting of grapes.
TECHNOLOGY OF GRAPE PROCESSING AND OBTAINING MUST
Transportation of grapes reception and unloading for processing. The crushing and de-stemming of grapes. Treatments applied to must. Separating the must from the solids. Grape yield in must.
CHEMICAL AND BIOLOGICAL COMPOSITION OF MUST
Chemical composition of must. Grape, must and wine sugars. The ozydes from grapes, must and wine. Pectic substances, gums and mucilaginous substances from must. Must acids. Nitrogenous substances from grapes, must and wine. Tannins from must and wine. Colour compounds from must and wine. The odorants of must and wine. Mineral substances from must and wine.
Biocatalysts of must and wine. Vitamins from grapes, must and wine. The enzymes that come from grapes. Enzymes produced by microorganisms. Enzymes from industrial enzyme preparations.
MUST PROCESSING TECHNOLOGY
Must processing technology. Assembly and blending of musts. Settling of must. Treatments applied to the must before fermentation.

Corrections to the composition applied to must and wine. Correction of the sugar content of the must by the addition of concentrated must. Correction of the sugar content of the must by the addition of food sugar. Correction of the sugar content of the must by partial concentration. Increased acidity of must and wine. Reduction of acidity of must and wine.
ANTISEPTIC AND ANTIOXIDANTS USED IN THE WINE INDUSTRY
Antiseptics and antioxidants used in the wine industry. SO_2 states and changes in wines. SO_2 actions in must and wine. Advantages and disadvantages of using SO_2 in vinification. The forms under which SO_2 is used. The time of sulphites, the doses and the technique of administration of SO_2. Use of sorbic acid in vinification. Use of ascorbic acid in vinification. Use of dialkyl pyrocarbonates in vinification
FERMENTATION AND MACERATION IN WINE PRODUCTION TECHNOLOGY
Alcoholic fermentation of must. Filling the fermentation vessels with must and equipping them. Phases of alcoholic fermentation. Spontaneous fermentation. Provoked fermentation. Technological variants of fermentation of must. Fermentation supervision and management. Must fermentation in continuous flow.
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. Winemaking by thermo-maceration.
MALOLACTIC FERMENTATION
Development of malolactic fermentation. The factors on which malolactic fermentation depends.

Practical works
Safety precautions in the lab.
Establishing the optimal time for grape harvest.
The volumetric mass and the relative density of the must and the wine.
Evaluation of the relative sugar content of must
Analysis of the alcoholic concentration of wine and distillates
Analysis of the total dry extract in must and wine.
Analysis of the total acidity of the must and wine.
Analysis of volatile acidity in wines.
Analysis the real acidity and the buffering effect in wine.
Analysis of tartaric acid from musts and wines.
Analysis of reductive sugars in musts and wines
Conditioning and stabilization of wine.
Analysis of chromatic characteristics in red wines.
Test.

Bibliography

Cotea, D.V., Zanoaga, V.C., Cotea, V.V., 2009 - *Tratat de Oenochimie*, vol. I, vol. II, Editura Academiei Române, Bucureşti.

Cotea, V.V., Cotea V.D., 2006 - *Tehnologii de producere a vinurilor*, Editura Academiei Române, Bucureşti.

Cotea, V.V., Zanoaga, V.C., Cotea V.D., 2010 – *Oenologie. Construcţii, vase si utilaje vinicole*, Editura Academiei Române, Bucureşti.

Pomohaci, N., Gheorghiţă, M., Iuoraş, R., Stoian, V., Cotrău, A., Cotea, V.V., 1990,- *Oenologie*, Editura Didactică şi Pedagogică, Bucureşt.

Pomohaci, N., Stoian, V., Gheorghiţă, M., Sîrghi, C., Cotea, V.V., Namoloşanu, I., 2000 - *Oenologie. Volumul 1: Prelucrarea strugurilor si producerea vinurilor*. Editura Ceres, Bucureşti.

Pomohaci, N., Cotea, V.V., Stoian, V., Namoloşanu, I., Popa, A., Sîrghi, C., Antoce, Arina, 2001, - *Oenologie. Volumul 2: Îngrijirea, stabilizarea si îmbutelierea vinurilor. Construcţii şi echipamente vinicole*. Editura Ceres, Bucureşti.

Evaluation

Evaluation form	Evaluation Methods	Percentage of the final grade
Course	Oral Exam	**50%**
Practical works	Evaluation during the semester	**30%**
	Final test	**20%**

Contact

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