

Code: 1567 Wine Microbiology**Degree:** 2nd cycle – Viticulture and Oenology**Curricular Year:** 1st**Credits:** 6 ECTS**Semester Course:** 1st**Compulsory****Language:** Portuguese/English**Prerequisites:** Biology (min. 6 ECTS)**Responsible:** Manuel José de Carvalho Pimenta Malfeito Ferreira**Other lecturer(s):** Virgílio Borges Loureiro**Web Site:** <http://www.isa.utl.pt/home/node/3904>**1. Contact hours:****Lectures 28 Practicals/Laboratory 42 Others 14 Total 84****2. Objectives:**

- To understand the ecological and biochemical basis of fermenting processes associated to the winemaking
- To study the use of starters in Enology
- To assimilate the fundamentals of hygiene in wine industry
- To know and monitor the spoilage microorganisms of wine, particularly yeasts and lactic acid bacteria
- To interpret microbiological analytical results

3. Programme:

Wine microbes and their natural habitat: vineyard/grape, winery and bottling line ecosystems.

Conversion of grape juice into wine: alcoholic fermentation, metabolic pathways, sugar and nitrogen compounds metabolism; wine fermentation, the specificity of grape juice; mixed populations, growth kinetics and affecting factors; starter utilisation, stuck fermentations.

Bioconversion of malic acid: by the vine, by the bacteria ("malolactic fermentation"), and by the yeast, the case of *Schizosaccharomyces* sp.. Lactic acid bacteria: cocci and rods, biochemistry and physiology of malolactic fermentation and biogenic amines, starter utilisation and affecting factors;

Wine spoilage microorganisms: yeasts, the cases of *Dekkera* spp. and of *Zygosaccharomyces* spp., film yeasts; lactic and acetic bacteria.

Wine microbiological stabilization: preservatives, thermal processes and filtration; hygiene and microbiological control, basic concepts of sanitation in Enology, cleaning and disinfection's programs, the HACCP in Enology.

4. Bibliography:**Main Bibliography**

Ribéreau-Gayon, P., Dubordieu, D., Donèche, B. and Lonvaud, A. (2000). Handbook of Enology: The Microbiology of Wine and Vinifications. John Wiley and Sons, Ltd, Chichester, Inglaterra. Cota Q021-210

Boulton, R., Singleton, V., Bisson, L. and Kunkee, R. (1995). Principles and Practices of Winemaking. Chapman & Hall, New York. Cota Q021-209

Other Bibliography

Fugelsang, K. (1997). Wine Microbiology. Chapman and Hall, Nova Iorque, EUA.

Hayes, P.R., 1985 - Food Microbiology and Hygiene. Elsevier Applied Science Publishers. London New York.

Fleet, G. (2003). Yeast interactions and wine flavor. *International Journal of Food Microbiology*, 86, 11-22.

Loureiro, V. and Malfeito-Ferreira, M. (2003). Spoilage yeasts in the wine industry. *International Journal of Food Microbiology*, 86, 23-50.

Malfeito-Ferreira, M., Tareco, M. e Loureiro, V. (1997). Fatty acid profiling: a feasible typing system to trace yeast contaminations in wine bottling plants. *International Journal of Food Microbiology*, 38, 143-155.

5. Assessment:

Frequency obtained by presence in, at least, 75% of practical classes. Final exam includes all taught subjects.

6. Estimated Workload:

168

 Hours

7. Last Update:

8/2/2011
