

**Programme:** M. Sc. (Botany)

**Course Code:** BOO-125

**Title of the Course:** Oenology (Wine Science and Technology)

**Number of Credits:** 1

**Effective from AY:** 2020-21

<b>Prerequisites for the course:</b>	Basic knowledge of fermented beverages and their cultural role.	
<b>Objective:</b>	strongly backed by local winemakers and industries and tourism department and appreciated by NAAC team in 2014 this short course covers the basics of wine and winemaking (enology) and the chemistry behind the process and all basic aspects of wine culture, history, anthropology, service, tasting and toasting wines and also delves on microvinification or small scale fruit wine production. A few demos would be given and a visit to local wineries would be organized.	
<b>Content:</b>	<ol style="list-style-type: none"><li>1. Overview of Enology, contrast between ancient and modern methods of wine making.</li><li>2. Viticulture and Grape species.</li><li>3. Wine Types and Styles, Wine Regions and Terroir, the Indian wine scene.</li><li>4. Harvesting and processing of grapes and other fruits.</li><li>5. Sources of contamination in wine making, Sanitation and Sterilization.</li><li>6. Scales of winemaking, microvinification, Materials and supplies used in wine making.</li><li>7. Chemistry and cell biology of fermentations with yeast and bacteria.</li><li>8. Fermentation Processes, Post-Fermentation.</li><li>9. Wine Analysis, Chemical Components of Wine, Biochemical Reactions in Fermentation.</li><li>10. Wine Acids, Aroma compounds (Terpenes), Color and FlavorCompounds (phenolics, Tannins).</li><li>11. Sensory evaluation and Quality control in wine making.</li><li>12. Wine bottling, corking, packaging and marketing.</li></ol>	<b>1hour</b> <b>1hour</b> <b>1hour</b> <b>1hour</b> <b>1hour</b> <b>1hour</b> <b>1hour</b> <b>1hour</b> <b>1hour</b> <b>1hour</b> <b>2hours</b> <b>Demo</b>
<b>Pedagogy:</b>	Lectures/ Tutorials/Assignments/Seminars/Videos/Expert Lectures/Industrial visits/Moodle based guidance/ Self-study	
<b>References/Readings</b>	<ol style="list-style-type: none"><li>1. Amerine, M. A., Berg, H. W., Kunkee, R. E., Ough, C. S., Singleton, V. L. and Webb, A. D. 1980. The Technology of Winemaking. 4<sup>th</sup> edition. AVI Publishing Co. Inc. Westport.</li><li>2. Amerine, M. A. and Roessler, E. B. 1983. Wines: Their sensory evaluation. WH Freeman &amp; Co. San</li></ol>	

	<p>Francisco.</p> <ol style="list-style-type: none"> <li>3. <b>Amerine, M. A. and Singleton, V. L.</b> 1977. Wine: An Introduction to the Wines of the World,</li> <li>4. Grape Cultivation, Techniques of Wine-making, and How to evaluate and Enjoy Wines. University of California Press.</li> <li>5. <b>Boulton, R. B., Singleton, V. L., Bisson, L. F. and Kunkee, R. E.</b> 1996. Principles and Practices of Winemaking. Chapman and Hall, New York.</li> <li>6. <b>Fleet, G. H.</b> 1993. Wine Microbiology and Biotechnology. Harwood Academic Publishers, Chur.</li> <li>7. <b>Fugelsang, K. C.</b> 1997. Wine Microbiology. Chapman &amp; Hall, New York.</li> <li>8. <b>Iland, P, Ewart, A. and Sitters, J.</b> 1993. Techniques for Chemical Analysis and Stability Tests of Grape Juice and Wine. Patrick Iland Wine Promotions, PO Box 131, Campbelltown, South Australia 5074.</li> <li>9. <b>Iland, P.</b> 1991. An Introduction to Wine: A Guide to the Making, Tasting, and Appreciation of Wine. Patrick Iland Wine Promotions, PO Box 131, Campbelltown, South Australia 5074.</li> <li>10. <b>Jackson, R. S.</b> 2000. Wine Science: Principles, Practice, Perception. Second Edition. Academic Press, Inc., 525 B Street, Suite 1900, San Deigo, California.</li> <li>11. <b>Linskens, H. F. and Jackson, J. F.</b> 1988. Wine Analysis: Modern Methods of Plant Analysis. New series volume 6. Springer Verlag.</li> <li>12. <b>Ough, C. S.</b> 1991. Winemaking Basics. Food Products Press, New York.</li> <li>13. <b>Ough, C. S. and Amerine, M. A.</b> 1988. Methods for Analysis of Musts and Wines. Second Edition. <b>J. Wiley &amp; Sons</b>, New York.</li> <li>14. <b>Ribereau-Gayon, P., D. Dubourdieu and B. Doneche, A. Lonvaud.</b> 2000. Handbook of Enology Volume 1: Microbiology of Wine and Vinifications. John Wiley &amp; Sons, New York.</li> <li>15. <b>Ribereau-Gayon, P., Y. Glories, A. Maugean and D. Dubourdieu.</b> 2000. Handbook of Enology Volume 2: Microbiology of Wine, The Chemistry of Wine Stabilization and Treatments. John Wiley &amp; Sons, New York.</li> <li>16. <b>Robinson, J.</b> 1994. The Oxford Companion to Wine. Oxford University Press, Oxford, New</li> </ol>	
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	<p>York.</p> <ol style="list-style-type: none"> <li>17. <b>Schahinger, G. and Rankine, B.</b> 1992. Cooperage for Winemakers: A manual on the construction, maintenance, and use of oak barrels. Ryan Publications, Adelaide, South Australia.</li> <li>18. <b>Storm, D. R.</b> 1997. Winery utilities: planning, design and operation. Chapman &amp; Hall, New York.</li> <li>19. <b>Vine, R. P.</b> 1981. Commercial Winemaking, Processing and Controls. AVI Publishing Co., Westport, CT.</li> <li>20. <b>Vine, R. P.</b> E. M. Harkness, T. Browning, C. Wagner, and B. Bordelon. 1997. Winemaking: from grape growing to marketplace. Chapman &amp; Hall, New York.</li> <li>21. <b>Waterhouse, A. L. and S. E. Ebeler.</b> 1998. Chemistry of Wine Flavor. American Chemical Society, Washington, D.C.</li> <li>22. <b>Zoecklein, B. W., Fugelsang, K. C., Gump, B. H. and Nury, F. S.</b> 1990. Production Wine Analysis. An AVI book.</li> <li>23. <b>Zoecklein, B. W., Fugelsang, K. C., Gump, B. H. and Nury, F. S.</b> 1995. Wine Analysis and Production. Chapman &amp; Hall, New York, NY.</li> </ol> <p><b>Enological websites</b>          Academic study of winemaking from the University of California, Davis  <a href="http://www.wineserver.ucdavis.edu">http://www.wineserver.ucdavis.edu</a>          web site for american journal of enology and viticulture.  <a href="http://www.ajevonline.org">http://www.ajevonline.org</a>          Internet journal of viticulture and enology          infowine  <a href="http://www.infowine.com">http://www.infowine.com</a></p>	
<b><u>Learning Outcomes</u></b>	<ol style="list-style-type: none"> <li>1. To be able to understand international trends in production and marketing of wines.</li> <li>2. Ability to appreciate the role of wine in culture, religion, industry and economy.</li> <li>3. Ability to work as an oenological consultant.</li> <li>4. Better prospects in tourism industry serving wines.</li> </ol>	