

<b>Module</b>	<b>Wine Chemistry and Analytical Techniques</b>
<b>Code</b>	MSLS_S15
<b>Degree Program</b>	Master of Science in Life Sciences (MSLS)
<b>ECTS Credits</b>	4
<b>Workload</b>	Fall term 120 h: Contact 42 h; Group Exercise 16 h; Self-study 62 h
<b>Module Coordinator</b>	<p><b>Name</b> Dr. Benoit BACH</p> <p><b>Phone</b> +41 22 363 40 50</p> <p><b>Email</b> benoit.bach@changins.ch</p> <p><b>Address</b> CHANGINS, Viticulture and Enology Route de Duillier 50, Case postale 1148, CH-1260 Nyon 1</p>
<b>Lecturers</b>	<ul style="list-style-type: none"> <li>• Dr Roland Riesen, CHANGINS, Viticulture and Enology</li> <li>• Dr Ramon Mira de Orduña, CHANGINS, Viticulture and Enology</li> <li>• Pascale Deneulin, CHANGINS, Viticulture and Enology</li> <li>• Dr Benoit Bach, CHANGINS, Viticulture and Enology</li> <li>• Guest lecturers</li> </ul>
<b>Entry Requirements</b>	Equivalent of a BSc in Chemistry, Biochemistry, Biology, or Enology Viticulture
<b>Learning Outcomes and Competences</b>	<p>After completing the module students will be able to:</p> <ul style="list-style-type: none"> <li>• Understand chemical wine composition and its relatedness with climate, viticultural and oenological practices</li> <li>• Identify major compounds responsible for wine aroma, mouthfeel and stability and their chemical properties and interactions</li> <li>• Select suitable analytical techniques to solve specific enology problems</li> <li>• Apply common and advanced analytical and sensory techniques to enology</li> </ul>
<b>Module Content</b>	<p>Analytical techniques</p> <ul style="list-style-type: none"> <li>• Critical understanding and selection of suitable analytical techniques to solve practical and scientific enology questions</li> <li>• Application of GC, GC-MS, HPLC-DAD, LC-MS and spectroscopy (UV-VIS, NIR) instrumentation, as well as LIMS</li> </ul> <p>Wine chemistry</p> <ul style="list-style-type: none"> <li>• Wines, quality and quality control: quality characteristics (principal wine aroma compounds and macromolecules) critical control points in wine processing (microbiological and colloidal stability)</li> <li>• Wine contaminants (OTA, biogenic amines, NIAS...); incidence and oenological strategies to reduce the risk.</li> <li>• Valorization techniques through sensory analysis</li> </ul>

<b>Teaching / Learning Methods</b>	Lectures and laboratory practice
<b>Assessment of Learning Outcome</b>	Written mid-term evaluations: 80% of the final grade Final exam: 20% of the final grade
<b>Bibliography</b>	Waterhouse A. L. and Ebeler S. E. Chemistry of Wine Flavor, Washington, D.C.:American Chemical Society, 1998. Moreno-Arribas M. V. and Carmen Polo M.. Wine Chemistry and Biochemistry, New York:Springer, 2009. McMaster M. C. HPLC: a Practical User's Guide, New York:VCH, 1994. McMaster M. C. and McMaster C.. GC/MS. A Practical User's Guide, New York:Wiley-VCH, 1998. Boulton, R.B., Singleton, V.L.; Bisson, L.F.; Kunkee, R.E. (1995) – Principles and Practices of Winemaking, Chapman & Hall, New York. Flanzy, C. (1998) – Oenologie, fondements scientifiques et technologiques. Tec & Doc, Londres, Nova Lorque, Paris. Jackson, R (1994) – Wine Science. Principles and Applications, Academic Press, New York. O.I.V. (2008) – Compendium of international methods of wine and must analysis. O.I.V., Paris. Ribéreau-Gayon, P. ; Glories, Y. ; Maujean, A. ; Dubourdieu, D. (1998) – Traité d'Oenologie. 2. Chemie du Vin, Stabilisation et Traitements, Dunod, Paris.
<b>Language</b>	English
<b>Comments</b>	The course will be supported by student self-directed study of scientific articles and laboratory work
<b>Last Update</b>	18.05.2018 / BB