

Module	Wine Chemistry and Analytical Techniques
Code	MSLS_S15
Degree Program	Master of Science in Life Sciences (MSLS)
ECTS Credits	4
Workload	120 h: Contact & Field work 75 lessons = 56 h; Self-study 64 h
Module Coordinator	<p>Name Dr. Benoit BACH</p> <p>Phone +41 22 363 40 50</p> <p>Email benoit.bach@changins.ch</p> <p>Address CHANGINS, Viticulture and Enology Route de Duillier 50, Case postale 1148, CH-1260 Nyon 1</p>
Lecturers	<ul style="list-style-type: none"> • Dr Roland Riesen, CHANGINS, Viticulture and Enology • Dr Ramon Mira de Orduña, CHANGINS, Viticulture and Enology • Pascale Deneulin, CHANGINS, Viticulture and Enology • Dr Liming Zeng, CHANGINS, Viticulture and Enology • Dr Marie Blackford, Agroscope • Dr Benoit Bach, CHANGINS, Viticulture and Enology • Guest lecturers
Entry Requirements	Equivalent of a Bachelor of Science in Chemistry, Biochemistry, Biology, or Enology Viticulture
Learning Outcomes and Competences	<p>After completing the module students will be able to:</p> <ul style="list-style-type: none"> • Understand chemical wine composition and its relatedness with climate, viticultural and oenological practices • Identify major compounds responsible for wine aroma, mouthfeel and stability and their chemical properties and interactions • Select suitable analytical techniques to solve specific enology problems • Apply common and advanced analytical and sensory techniques to enology
Module Content	<p>Analytical techniques</p> <ul style="list-style-type: none"> • Critical understanding and selection of suitable analytical techniques to solve practical and scientific enology questions • Application of GC, GC-MS, HPLC-DAD, LC-MS and spectroscopy (UV-VIS, NIR) instrumentation <p>Wine chemistry</p> <ul style="list-style-type: none"> • Wines, quality and quality control: quality characteristics (principal wine aroma compounds and macromolecules) critical control points in wine processing (microbiological and colloidal stability) • Wine contaminants (OTA, biogenic amines, NIAS...); incidence and oenological strategies to reduce the risk. • Valorization techniques through sensory analysis

Teaching / Learning Methods	Lectures and laboratory practice, active participation in the module is requested.
Assessment of Learning Outcome	Written mid-term evaluations: 80% of the final grade Final exam: 20% of the final grade
Bibliography	<ul style="list-style-type: none"> • 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.
Language	English
Comments	The course will be supported by student self-directed study of scientific articles and laboratory work
Last Update	30.04.2019 / BB