

# Master in Life Sciences

A cooperation between  
BFH, FHNW, HES-SO, ZHAW

<b>Module title</b>	<b>Advanced Sensory Techniques</b>
<b>Code</b>	F5
<b>Degree Programme</b>	Master of Science in Life Sciences
<b>Group</b>	Food
<b>Workload</b>	3 ECTS (90 student working hours: 42 contact lessons = 32 h; self-study = 58 h)
<b>Module Coordinator</b>	<p><b>Name:</b> Pascale Deneulin  <b>Phone:</b> +41 22 363 40 55  <b>Email:</b> <a href="mailto:pascale.deneulin@changins.ch">pascale.deneulin@changins.ch</a>  <b>Address:</b> CHANGINS, Route de Duillier 50, 1260 NYON</p>
<b>Lecturers</b>	<ul style="list-style-type: none"> <li>• Pascale Deneulin, HES-SO, CHANGINS</li> <li>• Pauline Rouchon, BFH</li> <li>• Annette Bongartz, ZHAW</li> <li>• Guest lecturers</li> </ul>
<b>Entry requirements</b>	<p>Bachelor of Science in Life Sciences, basic sensory and statistical competences</p> <p><u>Sensory competences:</u> the student should be familiar with basic sensory techniques (Discriminative analysis such as triangular test and two-out-of-five, Quantitative Descriptive Analysis, consumer acceptance and preference test) and basic physiology of human perception.</p> <p><u>Statistical competences:</u> the student should be able to manage data e.g. with R software for descriptive analysis (Analysis of Variance, Chi-square test, Regression) and have basic knowledge of multivariate analysis (such as Principal Component Analysis and Clustering). It is recommended to attend the CC courses D1 (“Handling and Visualising Data”).</p> <p>As preparation for the block week, students are required to read papers available on Moodle 4 weeks before the beginning of the course. They must also answer the quiz questions relating to prerequisites, this score counts for 10% of the final grade.</p> <p><b>See also information under “comments”</b></p>
<b>Learning outcomes and competences</b>	<p>After completing the module, students will be able to:</p> <ul style="list-style-type: none"> <li>• Conduct a sensory case study from the initial question to the conclusion</li> <li>• Manage a sensory tasting session (give instructions to panellists, train panellists and validate performance, explain the sensory procedure, manage sample presentation),</li> <li>• Select the appropriate sensory technique from a wide range of tests depending on the objective of the study,</li> <li>• Apply common and advanced sensory techniques to beverages and others food products,</li> <li>• Manage statistical tools to process sensory data,</li> <li>• Illustrate the results with appropriate graphic representations,</li> <li>• Interpret the results and conclude,</li> <li>• Consider consumer expectations in terms of external information (e.g. packaging, medal) and marketing design,</li> </ul>

	<ul style="list-style-type: none"> <li>• Discover the advantages and limitations of AI for sensory and consumer sciences, and develop critical insights into these tools.</li> <li>• Use AI in combination with R to analyse data.</li> <li>• Provide concrete recommendations based on sensory results in an industrial view.</li> </ul>
<b>Module contents</b>	<p>The module focusses on sensory aspects of food with two main thematic: consumer acceptance/preference and descriptive analysis included rapid sensory methods. The aim is to give an advanced level to food science master students to manage sensory tests in connection with research and marketing questions taking the needs of the industry into account.</p> <p><b>Sensory analysis in industrial context</b></p> <ul style="list-style-type: none"> <li>• Industry example: Use of consumer &amp; sensory methods along the development process</li> </ul> <p><b>Neuroscience of tasting</b></p> <ul style="list-style-type: none"> <li>• How the brain makes sense of food sensory dimensions</li> </ul> <p><b>Consumer perception</b></p> <ul style="list-style-type: none"> <li>• Hedonic testing: application of qualitative and quantitative test methods in order to collect consumer acceptance data and consumer insights, taking the adequate number of consumers as well as target groups into account.</li> <li>• Correlation of data: identification of relevant analytical attributes (from sensory analysis and instrumental evaluations) in the context of consumer preference. What are the sensory cues and drivers of liking? Segmentation of consumers based on their sensory preference or consumer insights.</li> <li>• Internal and external preference mapping</li> </ul> <p><b>Improvement of panel performance</b></p> <ul style="list-style-type: none"> <li>• Manage sensory panel: recruitment, training for Quantitative Descriptive Analysis and evaluation of panel performance</li> <li>• Validate panel performance</li> </ul> <p><b>Innovative sensory evaluation techniques</b></p> <ul style="list-style-type: none"> <li>• History and origin of developing new and faster sensory methods</li> <li>• For each new method: principle and sensory test, application, statistical analysis, pros and cons             <ul style="list-style-type: none"> <li>– Verbal-based methods: Flash profile and Check-All-That-Apply</li> <li>– Similarity-based methods: Free sorting and Napping / Projective mapping</li> <li>– Reference-based methods: Polarized Sensory Positioning and Pivot profile</li> </ul> </li> </ul> <p><b>Statistical data management</b></p> <ul style="list-style-type: none"> <li>• Statistical methods to analyze sensory / consumer data</li> <li>• Statistical methods to correlate sensory / consumer data with marketing or instrumental data (chemistry, production parameters or other)</li> <li>• How use AI to analyze data combining with R</li> </ul>
<b>Teaching / learning methods</b>	<ul style="list-style-type: none"> <li>• Previous self-study is mandatory – reading referenced papers</li> <li>• Lectures with practical examples</li> <li>• Sensory exercises (as panellist and as “panel leader”)</li> </ul>

# Master in Life Sciences

A cooperation between  
BFH, FHNW, HES-SO, ZHAW

	<ul style="list-style-type: none"> <li>• Practical data analysis</li> <li>• Final case-study</li> <li>• Active participation in the module is requested</li> </ul>																								
<b>Assessment of learning outcome</b>	<ol style="list-style-type: none"> <li>1. Pre-requisite quiz (10%)</li> <li>2. Case study (30%): the grade of case study included the practical part, data analysis, interpretation and oral presentation on Friday.</li> <li>3. Written exam on Moodle, individual, open-book, final (60%)</li> <li>4. Re-exam consists of writing a report on the case study</li> </ol>																								
<b>Format</b>	Summer School																								
<b>Timing of the module</b>	<p>Spring semester, week 23</p> <table border="1"> <thead> <tr> <th>Day of the block week</th> <th>&lt;1</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>&gt;5</th> </tr> </thead> <tbody> <tr> <td>Contact teaching (lessons)</td> <td></td> <td>8</td> <td>9</td> <td>9</td> <td>8</td> <td>8</td> <td></td> </tr> <tr> <td>Self-study (hours)</td> <td>11</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>2</td> <td>37</td> </tr> </tbody> </table>	Day of the block week	<1	1	2	3	4	5	>5	Contact teaching (lessons)		8	9	9	8	8		Self-study (hours)	11	2	2	2	2	2	37
Day of the block week	<1	1	2	3	4	5	>5																		
Contact teaching (lessons)		8	9	9	8	8																			
Self-study (hours)	11	2	2	2	2	2	37																		
<b>Venue</b>	Changins, haute école de viticulture et œnologie, 1260 NYON																								
<b>Bibliography</b>	<p>Final bibliography will be available on Moodle 4 weeks before the beginning of the module.</p> <p>Delarue, J., Lawlor, B., Rogeaux, M. (2014). Rapid Sensory Profiling Techniques. Application sin new product development and consumer research. <i>Ed. Woodhead Publishing</i>, 584p.</p> <p>Dehlholm, C., Brockhoff, P. B., Meinert, L., Aaslyng, M. D., &amp; Bredie, W. L. P. (2012). Rapid descriptive sensory methods - Comparison of Free Multiple Sorting, Partial Napping, Napping, Flash Profiling and conventional profiling. <i>Food Quality and Preference</i>, 26(2), 267–277. <a href="https://doi.org/10.1016/j.foodqual.2012.02.012">https://doi.org/10.1016/j.foodqual.2012.02.012</a></p> <p>Faye, P., Brémaud, D., Teillet, E., Courcoux, P., Giboreau, A., &amp; Nicod, H. (2006). An alternative to external preference mapping based on consumer perceptive mapping. <i>Food Quality and Preference</i>, 17(7–8), 604–614. <a href="https://doi.org/10.1016/j.foodqual.2006.05.006">https://doi.org/10.1016/j.foodqual.2006.05.006</a></p> <p>Lathey, K. A., Bramley, B. R., &amp; Francis, I. L. (2010). Consumer acceptability, sensory properties and expert quality judgements of Australian Cabernet Sauvignon and Shiraz wines. <i>Australian Journal of Grape and Wine Research</i>, 16(1), 189–202.</p> <p>Valentin, D., Chollet, S., Lelièvre, M., &amp; Abdi, H. (2012). Quick and dirty but still pretty good: a review of new descriptive methods in food science. <i>International Journal of Food Science &amp; Technology</i>, 47(8), 1563–1578. <a href="https://doi.org/10.1111/j.1365-2621.2012.03022.x">https://doi.org/10.1111/j.1365-2621.2012.03022.x</a></p>																								
<b>Language</b>	English																								
<b>Links to other modules</b>	The present module will build on CC modules D1 (“Handling and Visualising Data”) and D3 (“Modelling and Exploration of Multivariate Data”).																								
<b>Comments</b>	<p>There is a participant limit in this module. Registrations will be considered as follows:</p> <ol style="list-style-type: none"> <li>1. Students for whom F5 is a compulsory module</li> <li>2. Students from the Food-Cluster</li> <li>3. Students who need the ECTS for the graduation in the semester concerned</li> <li>4. The remaining places will be drawn by lot</li> </ol> <p>Whether participation is possible will be communicated by the end of week 07.</p>																								
<b>Last Update</b>	04.09.2025																								