

## Food Forensics and Toxicology

Minor code	LFL361VE1		
Education cycle	1st cycle (bachelor)		
Mode of delivery	On-campus		
Study programme	Forensic Laboratory Research		
Part of study year	Year 3		
Location	Leeuwarden		
Semester	Spring semester; terms 3 and 4		
Number of credits (ECTS)	30		
Language of instruction	English		
Target group	Van Hall Larenstein students: Forensic Sciences, Chemistry, Life Sciences, Food Technology External students, Erasmus+ students		
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Entry requirements and prerequisites	At least 100 ECTS, including propaedeutic exam, in a study programme in forensic sciences, life sciences, chemistry, food technology or related. Basic knowledge about biochemistry, and experience working safely in an analytical chemistry and/or (molecular) biology lab.		
Application procedure	Consult <a href="#">Exchange possibilities</a>		
Major study units	<b>Term of teaching</b>	<b>Study unit code</b>	<b>Name of the study unit</b>
	Terms 3 and 4	X	Case study Food Fraud
	Terms 3 and 4	X	Case study Toxicology
	Term 3	X	Practical assignment Food defense & Fraud
	Term 3	X	Theoretical exam I
	Term 4	X	Theoretical exam II
Content	<p><b>Food Forensics</b></p> <p>Are you also 'sick' of food fraud? Then sink your teeth into this and discover the truth behind the food label for yourself. With targeted lectures on food defense, food technology, investigation strategies and analysis techniques by internal and external experts, you will gain insight into fraud investigation within the food sector. True food crime stories are analyzed and reconstructed. Forensic chemical and biological analysis methods are used and weighed as legal and convincing evidence. Armed with this knowledge and skills, you conduct your own investigation into food fraud. You formulate hypotheses and test them against the results of your own analyses. Excursions offer a further glimpse into this (inter)national field.</p> <p><b>Toxicology</b></p> <p>Does the presence of a substance in our food pose a health risk, is a discharge harmful to the environment and how can you determine that a substance has contributed to an unnatural death? To answer these types of questions, we first provide you with the basic knowledge that every toxicologist needs. You gain insight into absorption, distribution, metabolism and excretion of substances, their mechanisms of action and you delve into toxicity tests and risk assessment methods. You also apply toxicity tests yourself and you increase your insight into anatomy through a cutting practical on the rat. Various forensic toxicological practical examples are discussed by various (external) experts. This minor also pays specific attention to drugs, alcohol, pathology, autopsy and relevant legal frameworks. You then apply the acquired knowledge in a (forensic) toxicological case study in which analytical methods, toxicological interpretation and reporting are central.</p>		

Competences	Research level 2 (advanced) Experimenting level 2 (advanced)
Learning goals	<b>Food Forensics</b> <ul style="list-style-type: none"> <li>• Gain insight into food forensics issues and case studies</li> <li>• Gain insight into detection methods within the food sector</li> <li>• Gain insight into the production processes of food products</li> <li>• Gain insight into quality and information management (including HACCP, TACCP, VACCP)</li> <li>• Gain insight into and apply advanced analytical chemical techniques that are applied within the theme of food forensics</li> <li>• Gain insight into (and possibly apply) molecular biological techniques that are applied within the theme of food forensics</li> <li>• Gain insight into and apply (advanced) data analysis techniques</li> <li>• Expand experience in forensic analytical chemistry</li> <li>• Obtain knowledge of relevant legal frameworks regarding food fraud</li> </ul> <b>Forensic Toxicology</b> <ul style="list-style-type: none"> <li>• Gain insight into the field of toxicology (including toxicokinetics and toxicodynamics, organ toxicology, risk assessment, post-mortem toxicology)</li> <li>• Gain knowledge about toxicological assays</li> <li>• Gain insight into methods for detecting substances and studying toxicological responses</li> <li>• Carrying out a scientific toxicological literature study</li> <li>• Obtain knowledge of relevant legal frameworks in forensic toxicology</li> <li>• Gain insight into pathological responses</li> <li>• Interpreting forensic toxicological data</li> </ul>
Added value	<ul style="list-style-type: none"> <li>• Unique minor that meets labor market needs</li> <li>• Interdisciplinary: students from various disciplines participate. Knowledge is offered at your own level</li> <li>• Case studies (in small groups) and research questions from practice are discussed (partly from the Safety in the food chain research group)</li> <li>• Company visits to gain affinity with the industry</li> <li>• Good preparation for an internship or graduation assignment in toxicology, food fraud, and/or analytical chemistry</li> </ul>
Mandatory literature	Casarett & Doull's Essentials of Toxicology, 9780071847087
Teaching methods and student workload	<ul style="list-style-type: none"> <li>• Lectures including various guest lectures</li> <li>• Seminars</li> <li>• Work discussions / tutor groups</li> <li>• Practicals</li> <li>• Drafting a research proposal</li> <li>• Conduct research</li> <li>• Presentation / jury discussions</li> <li>• Reporting</li> <li>• Field trips</li> <li>• Self study</li> </ul> 30 ECTS = 840 hours in total
Assessment	<ul style="list-style-type: none"> <li>• 2x theoretical exam (written)</li> <li>• Practical assignment Food defense &amp; fraud*</li> <li>• Case study Food fraud*</li> <li>• Case study Toxicology*</li> </ul> <p>* These assessments apply per working group, but will be individual if necessary</p>
Evaluation scale	Grades between: 1-10; 0,1 interval; 5,5 pass View <a href="#">ECTS credits and grading</a>