

5.0 credits

30.0 h + 22.5 h

1q

Teacher(s) :	Collin Sonia ;
Language :	Français
Place of the course	Louvain-la-Neuve
Main themes :	<p>The course is structured in 5 parts addressing respectively :</p> <p>A- Major food constituents : physico-chemical attributes, chemical reactivity, functional properties, transformation processes. In particular, 4 chemical families will be covered : carbohydrates and related Maillard reactions, lipids and related chemical and enzymatic oxidative degradations (role of polyphenols and other antioxidants), proteins and water (water activity monitoring).</p> <p>B- Analytical methods applied to major food constituents covered in part A.</p> <p>C- Minor food constituents : chemical structure, reactivity and functional properties of sweeteners, cyclodextrins, hydrocolloids, emulsifiers, fat mimics, colourings, flavours and contaminants (dioxins, PCB, mycotoxins, nitrosamines, acrylamide..).</p> <p>D- Analytical methods applied to minor food constituents covered in part C.</p> <p>E- Special focus on beer ingredients : special malt flavours, dimethylsulfide and other sulphur aroma, hop chemistry (bitter substances and flavour), foam structure, malt and hop polyphenols, ageing. Through practical training, typical brewery jargon will be described.</p>
Aims :	<p>The lessons are intended for Bio-Engineers and BRAS3DS students. They are aimed at developing knowledge of organoleptic and nutritional impact of food transformations, from raw materials to final products.</p> <p><i>The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".</i></p>
Content :	<p>Through five blocks, the course highlights the physicochemistry of food ingredients.</p> <p>A- Major food constituents :</p> <ul style="list-style-type: none"> -carbohydrates : structure of mono and disaccharides, caramelisation and Maillard reactions; -lipids : structure, polymorphism and intersolubility, chemical and enzymatic oxidations, structure and mechanisms of antioxidants (polyphenols,..); -proteins of milk, gelatin and cereals; -definition and monitoring of water activity. <p>B- Analytical methods applied to major food constituents covered in part A : Soxhlet and FAME for lipids, antioxidant activity, HPLC of sugars, nitrogen fractions.</p> <p>C- Minor food constituents : structure and efficiency of most sweeteners, structure and properties of cyclodextrins, hydrocolloids, emulsifiers, fat mimics, colourings, flavours and contaminants (dioxins, PCB, mycotoxins, nitrosamines, acrylamide..).</p> <p>D- Analytical methods applied to minor food constituents covered in part C : some examples for contaminants, flavours, vitamins, ..</p> <p>E- Special focus on beer ingredients : flavours, colour and reduction power of special malts, synthetic pathways of dimethylsulfide and other sulphur aroma, hop chemistry (bitter substances and flavour), foam structure, malt and hop polyphenols through the brewing process, off-flavours through beer ageing. Through practical training will be learnt how to produce and analyze a beer.</p>
Other infos :	<p>Precursorycourses Organic chemistry, analytical chemistry, analytical techniques, biochemistry</p> <p>Evaluation Exam in written form appraising acquisition of theory and the capability to investigate complex chemical systems</p> <p>Support Syllabus</p>
Cycle and year of study :	<p>> Master [120] in Chemistry and Bio-industries</p> <p>> Master [120] in Agricultural Bioengineering</p> <p>> Advanced Master in Bio-engineering : Brewery</p> <p>> Master [60] in Biology</p> <p>> Master [120] in Biochemistry and Molecular and Cell Biology</p>
Faculty or entity in charge:	AGRO