UCL Université catholique de Louvain

LBRAL2201C

2015-2016

Food Technology (procédés biotechnologies)

1.0 credits		1q

Teacher(s) :	
Language :	Anglais
Place of the course	Louvain-la-Neuve
Inline resources:	Icampus
Prerequisites :	The prerequisites for this course are the basic knowledge of chemistry, biochemistry and other natural sciences as gained during the different bachelors. No other prerequisites are needed. Courses which are giving more details on some of the discussed topics are: Génie des procédés : opérations unitaires [BIRC2109A] Biochimie brassicole [LBRAL2105] Chimie brassicole [BRAL2106] Chimie des denrées alimentaires [BRAL2103] Qualité organoleptique et microbiologique d'un aliment [BRAL2101]
Main themes :	The goal of this course is to give the students the understanding of the technological value added during the food and beverage production process. The course shall lead the students to combine their basic knowledge of biochemistry, microbiology as well as energetic and environmental aspects with the technological possibilities to influence the creation of high quality food and beverages with respect to production costs, legislative restrictions as well as influences on the sustainability of the product. The course will therefore use the malting and brewing processes as model process to explicitly describe the different production steps from the raw material intake till the packaged products (unit operations for separation : sorting, filtration, decantation, centrifugation, distillation,' and conservation). In further lectures the gained knowledge will be applied to explain the analogies to other food processes and their specific differences (planned: meat, dairy, distilled products, fruits/vegetables). The students will further develop in their practical work process descriptions for these industries in a seminar style.
Aims :	a. Contribution de l'activité au référentiel AA (AA du programme) 1.1, 1.2, 1.4, 1.5 2.1, 2.2, 2.4 4.1, 4.2, 4.6 7.3 b. Formulation spécifique pour cette activité des AA du programme In the end of this part of the course, the student, is able to: - identify the conflicting priorities in food production and their impact on food products - analyze a process in the food industry holistically by considering all impacts on food quality, cost and the impact on the environment from raw materials till finished product - differentiate between different solutions for the same process step by evaluating their unique advantages and disadvantages with regards to the food production factors - develop own ideas for process improvements - transfer the learned principles to any other process in the food industry to understand and describe it - create a 'pilot process' in small scale out of the learned knowledge and understand its shortcomings compared to the industrial process *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".*
Evaluation methods :	The evaluation of the learned content is done by the discussion and appraisal of the produced presentation and an oral or written exam
Teaching methods :	The course is based on powerpoint presentations with multimedia content (embedded movies) and completed by the presentation (and distribution for the trials) of raw materials, process aids, process equipment, and example systems. Elearning is not explicitly included.
Content :	1. Introduction (development what is Food Technology, how to work scientifically and interpret results) 2. Water technology

a. Water and waste water treatment
b. Water as raw material

3. Sterilization technology
a. Basics of cooling and refrigeration

b. Basics of pasteurization and sterilization processes
c. High pressure treatment of food

4. Cereal technology
a. The raw materials (mainly barley and wheat, but also corn, rice, sorghum, and others)

b. Malting
   i. Cereal processing and Cereal storage
   ii. Steeping and Germination
   iii. Kilning and special malts with practical evaluation
   iv. Malting - practical malting trial**

c. Baking and pasta production

5. Brewing technology
a. Raw Material Intake and Milling

b. Mashing

c. Lautering / Mash filtration
d. The raw material hop and hop products with practical hop evaluation

e. Boiling and heat recovery (possibly with pratical brewing demonstration)

f. Wort treatment (clarification, cooling, ...)

g. Yeast and yeast treatment

h. Fermentation and maturation (possibly with fermentation trial**)

i. Stabilization and Filtration

6. Spirits technology
a. Raw materials and distillation process

b. Whisk(e)y with practical flavor evaluation

7. Dairy technology
a. Milk production

b. Butter production

c. Cheese and fermented milk products (Yoghurt)*

d. Practical butter and cheese production trial**

8. Meat technology
a. Fresh meat production*

b. Ham and sausages*

9. Technology for fruits and vegetables
a. Production processes of canned fruits, frozen fruits, dried fruits, and potato chips*

b. Vegetable oil production*
10. Other food production processes ' Practical work / presentations of students*

11. Packaging technology
a. Packaging properties and needs

b. Packaging machinery and packaging plants

12. Automation and IT in the food industry
a. Basics of automation and communication with practical demonstration

b. Production systems with practical demonstration

	*parts of these lectures can be done by the students practical work / presentations. ** practical trials by the students with presentation of the used methods
Bibliography :	Paperback of the course are available in icampus. It is recommended that the student brings them with him/her for the lessons. Supports de cours facultatifs : - Briggs, E., et al.: Brewing: science and practice, 2004, Woodhead Publishing Limited, ISBN: 978-1855734906 - Kunze, W.: Technology brewing and malting, 4th updated English Edition, May 2010, ISBN: 978-3-921690-64-2, -Jeantet, R. et al.: Science des aliments ' 2. Technologie des produits alimentaires, Lavoisier, 2007, ISBN 978-2-7430-0888-8 -EUROPEAN COMMISSION: Reference Document on Best Available Techniques in the Food, Drink and Milk Industries, 2006, online available underhttp://eippcb.jrc.es/reference/BREF/fdm_bref_0806.pdf
Faculty or entity in charge:	AGRO

Programmes / formations proposant cette unité d'enseignement (UE)				
Intitulé du programme	Sigle	Credits	Prerequis	Acquis d'apprentissage
Master [120] in Biochemistry and Molecular and Cell Biology	BBMC2M	1	-	