Course Syllabus

**offered by Department of Chemistry
with effect from Semester A 2020/21**

This form is for the completion by the _Course Leader_. The information provided on this form is the official record of the course. It will be used for the City University's database, various City University publications (including websites) and documentation for students and others as required.

Please refer to the Explanatory Notes on the various items of information required.

Prepared / Last Updated by:

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City University of Hong Kong
Course Syllabus

offered by Department of Chemistry
with effect from Semester A 2020/21

Part I   Course Overview

Course Title:	Food Chemistry
Course Code:	CHEM4043
Course Duration:	1 semester
Credit Units:	3 credits
Level:	B4
Proposed Area: *(for GE courses only)*	☐ Arts and Humanities ☐ Study of Societies, Social and Business Organisations ☐ Science and Technology
Medium of Instruction:	English
Medium of Assessment:	English
Prerequisites: *(Course Code and Title)*	CHEM2003/BCH2003 Biochemistry or CHEM2007/BCH2007 Principles of Organic Chemistry
Precursors: *(Course Code and Title)*	Nil
Equivalent Courses: *(Course Code and Title)*	BCH4043 Food Chemistry
Exclusive Courses: *(Course Code and Title)*	Nil

Part II   Course Details

1.   Abstract
(A 150-word description about the course)

This course in Food Chemistry will enable students to develop their knowledge and capability in dealing with the chemical nature of foods. Students will develop their understanding in the effect of chemical and biochemical reactions on the quality and safety of food. They will also identify and analyse the physico-chemical properties of foods and the origin of off-flavors in foods with respect to chemical changes in natural food constituents (oxidation, lipolysis, and browning). They will also apply various techniques to solve problems in situations encountered during storage of food.

2.   Course Intended Learning Outcomes (CILOs)
(CILOs state what the student is expected to be able to do at the end of the course according to a given standard of performance.)

No.	CILOs#	Weighting* (if applicable)	Discovery-enriched curriculum related learning outcomes (please tick where appropriate)		
			A1	*A2*	*A3*
1.	Explain the chemical nature of foods and their major components (carbohydrates, lipids and proteins).		✓	✓	
2.	Analyse the chemical and biochemical properties of foods.		✓	✓	✓
3.	Design protocols to use various techniques in analysing food samples.		✓	✓	✓
4.	Determine the deteriorative chemical and biochemical reactions, and their chemical kinetics in food handling, processing and storage.		✓	✓	
5.	Evaluate the role and the functionalities of the chemical additives to foods, and each ingredient listed on a food label.		✓	✓	
	If weighting is assigned to CILOs, they should add up to 100%.	100%			

* If weighting is assigned to CILOs, they should add up to 100%.
 # Please specify the alignment of CILOs to the Gateway Education Programme Intended Learning outcomes (PILOs) in Section A of Annex.

A1:   Attitude
   Develop an attitude of discovery/innovation/creativity, as demonstrated by students possessing a strong sense of curiosity, asking questions actively, challenging assumptions or engaging in inquiry together with teachers.
A2:   Ability
   Develop the ability/skill needed to discover/innovate/create, as demonstrated by students possessing critical thinking skills to assess ideas, acquiring research skills, synthesizing knowledge across disciplines or applying academic knowledge to self-life problems.
A3:   *Accomplishments*
   Demonstrate accomplishment of discovery/innovation/creativity through producing /constructing creative works/new artefacts, effective solutions to real-life problems or new processes.

3. Teaching and Learning Activities (TLAs)
(TLAs designed to facilitate students' achievement of the CILOs.)

TLA	Brief Description	CILO No.					Hours/week (if applicable)
		1	2	3	4	5	
Lectures and group activities	Lectures followed by small group activities will introduce the chemical nature of foods and the major components (carbohydrates, lipids and proteins).	✓					
Lectures, case studies and assignments	Lectures followed by case studies and assignments will enable students to analyse the chemical and biochemical properties of foods.		✓				
Case studies	Through case studies, students will design and discuss the various spectroscopic techniques and methods that are employed for food analysis.			✓			
Case studies, discussion, and group projects	Through case studies, discussion, group projects and oral presentations, students will critically evaluate the deteriorative mechanisms in food handling, processing and storage.				✓		
Case studies, group projects and presentations	Students will examine the role of chemical additives to foods and their functionalities critically through case studies, group projects and presentations.					✓	

4. Assessment Tasks/Activities (ATs)
(ATs are designed to assess how well the students achieve the CILOs.)

Assessment Tasks/Activities	CILO No.					Weighting*	Remarks
	1	2	3	4	5		
Continuous Assessment: <u>40%</u>							
Tutorial Assignments		✓				5%	
Quizzes / Assignments / Discussion	✓		✓	✓	✓	35%	
Examination: <u>60%</u> (duration: 3 hours)							

* The weightings should add up to 100%.　　　100%

Starting from Semester A, 2015-16, students must satisfy the following minimum passing requirement for courses offered by CHEM:
"A minimum of 40% in both coursework and examination components."

5. Assessment Rubrics

(Grading of student achievements is based on student performance in assessment tasks/activities with the following rubrics.)

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B, B-)	Fair (C+, C, C-)	Marginal (D)	Failure (F)
1. Tutorial Assignments	Ability to understand and apply scientific knowledge in food chemistry	High	Significant	Moderate	Basic	Not even reaching marginal levels
2. Quizzes / Assignments / Discussion	1. Ability to analyse difficulties or problems in food processing and storage; 2. Ability to apply scientific knowledge in food chemistry to tackle challenges in the food related processes	High	Significant	Moderate	Basic	Not even reaching marginal levels
3. Examination	1. Ability to explain in detail the chemical changes in food under different conditions and in various food processing; 2. Ability to explain the functional properties of different food components and ingredients; 3. Ability to propose solutions to tackle challenges in the food related processes based on the scientific knowledge in food chemistry.	High	Significant	Moderate	Basic	Not even reaching marginal levels

Part III   Other Information (more details can be provided separately in the teaching plan)

1. **Keyword Syllabus**
   (An indication of the key topics of the course.)

   - Introduction to Food Chemistry
   - Water and its physico-chemical characteristics
   - Carbohydrate components in food
   - Chemistry of lipids in relation to lipid characteristics, emulsions and gels
   - Protein structure in relation to food characteristics and nutritional value
   - Chemical and biochemical properties of foods
   - Chemical food additives and their functionalities in food processing
   - Analysis of foods

2. **Reading List**

2.1 **Compulsory Readings**
   (Compulsory readings can include books, book chapters, or journal/magazine articles. There are also collections of e-books, e-journals available from the CityU Library.)

1.	
2.	
3.	
…	

2.2 **Additional Readings**
   (Additional references for students to learn to expand their knowledge about the subject.)

1.	*Food Chemistry*, 3rd Edition, O. R. Fennema Ed., Marcel Dekker, Inc., New York, 1996.
2.	*Food Chemistry*, 3rd Edition, H.-D. Beliz, W. Grosch and P. Schieberle Eds., Springer, Berlin; New York, 2004.
3.	Online Resources: N.A.

A. Please specify the Gateway Education Programme Intended Learning Outcomes (PILOs) that the course is aligned to and relate them to the CILOs stated in Part II, Section 2 of this form:

GE PILO	**Please indicate which CILO(s) is/are related to this PILO, if any** *(can be more than one CILOs in each PILO)*
PILO 1: Demonstrate the capacity for self-directed learning	
PILO 2: Explain the basic methodologies and techniques of inquiry of the arts and humanities, social sciences, business, and science and technology	
PILO 3: Demonstrate critical thinking skills	
PILO 4: Interpret information and numerical data	
PILO 5: Produce structured, well-organised and fluent text	
PILO 6: Demonstrate effective oral communication skills	
PILO 7: Demonstrate an ability to work effectively in a team	
PILO 8: Recognise important characteristics of their own culture(s) and at least one other culture, and their impact on global issues	
PILO 9: Value ethical and socially responsible actions	
PILO 10: Demonstrate the attitude and/or ability to accomplish discovery and/or innovation	

GE course leaders should cover the mandatory PILOs for the GE area (Area 1: Arts and Humanities; Area 2: Study of Societies, Social and Business Organisations; Area 3: Science and Technology) for which they have classified their course; for quality assurance purposes, they are advised to carefully consider if it is beneficial to claim any coverage of additional PILOs. General advice would be to restrict PILOs to only the essential ones. (Please refer to the curricular mapping of GE programme: http://www.cityu.edu.hk/edge/ge/faculty/curricular_mapping.htm.)

B. Please select an assessment task for collecting evidence of student achievement for quality assurance purposes. Please retain at least one sample of student achievement across a period of three years.

Selected Assessment Task