

## Course Syllabus

offered by Department of Chemistry  
with effect from Semester B 2024 /2025

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:**

Name: Prof. KO Chi Chiu Vincent Academic Unit: Department of Chemistry  
Phone/email: 3442 6958/  
vinccko@cityu.edu.hk Date: 12 January 2024

**City University of Hong Kong  
Course Syllabus**

**offered by Department of Chemistry  
with effect from Semester B 2024 / 25**

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**Part I Course Overview**

**Course Title:** Food Processing and Food Chemistry

**Course Code:** CHEM6114

**Course Duration:** 1 Semester

**Credit Units:** 3 credits

**Level:** P6

**Medium of Instruction:** English

**Medium of Assessment:** English

**Prerequisites:**  
(Course Code and Title) Nil

**Precursors:**  
(Course Code and Title) Nil

**Equivalent Courses:**  
(Course Code and Title) BCH6114 Food Processing and 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 Processing and Food Chemistry will enable students to develop their knowledge and capability in dealing with the composition and properties of food as well as the chemical changes it undergoes during handling, processing and storage. Students will develop their understanding in the effect of chemical and biochemical reactions on the quality and safety of food. They will also identify problems in food sample and apply techniques to solve problems in situations encountered during storage and processing 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.	Demonstrate an understanding of the chemical nature of foods and the major components (carbohydrates, lipids and proteins) of milk, meat, eggs, cereal grains, and fruits and vegetables.		✓	✓	
2.	Analyse the physico-chemical properties of foods.		✓	✓	
3.	Design protocol and apply various techniques in analysing food samples.		✓	✓	✓
4.	Examine the role of natural and synthetic substances that are added to foods and their functionalities.		✓	✓	
5.	Determine the deteriorative chemical and biochemical reactions, and their chemical kinetics in food handling, processing and storage.		✓	✓	✓
* If weighting is assigned to CILOs, they should add up to 100%.		100%			

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		
	Lecture followed by small group activities will introduce the chemical nature of foods and the major components	✓						

	(carbohydrates, lipids and proteins) of milk, meat, eggs, cereal grains, and fruits and vegetables.							
	Lecture followed by (i) small group discussion on literature findings and independent analyses of literature data on selected topics and themes on the analysis of physico-chemical properties of food, and (ii) online assignment.		✓					
	Through case studies, students will discuss the various spectroscopic techniques and methods that are employed for food analysis.			✓				
	Students will examine the role of natural and synthetic substances that are added to foods and their functionalities through case studies and group projects and presentation.				✓			
	Through case studies, online discussions, group projects, and oral presentations on food processing, students will critically evaluate the applicability and limitations of various food processing strategies/technologies used in the food industry.					✓		

#### 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> %							
Quizzes / Assignments / Discussion	✓	✓	✓	✓		20%	
Group projects and presentation					✓	20%	
Examination: <u>60</u> % (duration: 3 hours)							
* The weightings should add up to 100%.						100%	

## 5. Assessment Rubrics

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

Applicable to students admitted in Semester A 2022/23 and thereafter

Assessment Task	Criterion	Excellent (A+, A, A-)	Good (B+, B)	Marginal (B-, C+, C)	Failure (F)
Quizzes / Assignments / Discussion	1. Ability to understand and apply scientific knowledge in food chemistry; 2. Ability to analyse difficulties or problems in food processing and storage;	High	Significant	Moderate	Not even reaching marginal levels
Group projects and presentation	1. Ability to identify and analyse the limitations of the current technologies used by the food industry; 2. Ability to apply scientific knowledge in food chemistry to tackle challenges in the food related processes; 3. Ability to propose solutions to tackle limitations in the food industry based on the scientific knowledge in food chemistry.	High	Significant	Moderate	Not even reaching marginal levels
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	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
- Vitamins and their characteristics
- Natural and synthetic food additives and their functionalities in food processing
- Food processing – principles and applications
- 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.	<i>Food Chemistry, 3<sup>rd</sup> Edition, O. R. Fennema Ed., Marcel Dekker, Inc., New York, 1996.</i>
2.	<i>Food: The Chemistry of Its Components, 4<sup>th</sup> Edition, T. P. Coultate Ed., Royal Society of Chemistry, Cambridge, UK, 2002.</i>

**2.2 Additional Readings**

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

1.	
2.	