



## Course Syllabus (Academic Year 2020)

School of Interdisciplinary Studies, Kanchanaburi Campus, Mahidol University

1. **Course No. and Title** : KAFT 320 Food Chemistry 1  
**Credit (study hours)** : 4(3-3-7)
2. **Program Name** : Bachelor of Science in Food Technology
3. **Course Module** : Specialized/Specific core  
**Pre/co-requisite** : KAID 220 Basic Organic Chemistry
4. **Class Semester** :  1<sup>st</sup> Semester  2<sup>nd</sup> Semester Academic Year 2020
5. **Class Schedule & Venue** : Lecture every Thursday at 9:00 – 12:00, 13:00 – 16:00 by Webex  
Lab every Thursday at 9:00 – 12:00, 13:00 – 16:00  
 Room (ต้องการใช้ห้องเรียนในวิทยาเขตฯ ในการสอนออนไลน์และการสอบนอกตาราง)  
 Laboratory Room L-112, L-305
6. **Class Coordinator** : Dr. Chutikarn Kapcum  
Contact No. : 099-2914694, Email : Kapcum.chu@gmail.com

### 7. Course Description

Physical and chemical change in food components, water, colloid system in foods, protein, lipid, carbohydrate, vitamin and mineral, enzyme, pigment, browning reaction, rancidity in food.

### 8. Course Objectives / Course Learning Outcomes (CLOs)

No.	Objectives / CLOs	Expected Skills / Knowledge			PLOs
		Specific	Generic	Knowledge	
8.1	Students will be able to explain the changes in physicochemical properties of foods based on their components and relate them to the food quality นักศึกษาสามารถอธิบายการเปลี่ยนแปลงทางเคมีกายภาพของอาหารจากองค์ประกอบต่างๆ และสามารถเชื่อมโยงการเปลี่ยนแปลงที่เกิดขึ้นกับคุณภาพของอาหารได้	S5: Skill in identify important characteristics of food	G4: Associating skill	K2: Food Chemistry	2
8.2	Students will be able to perform basic food chemistry experiments based on the laboratory instructions with ethics and time management นักศึกษาสามารถทำการทดลองทางเคมีอาหารพื้นฐานโดยทำตามคู่มือบทปฏิบัติการได้อย่างมีจริยธรรมและบริหารจัดการเวลาได้	S11: Skill in conducting experiment	G3: Ethics G7: Time management	K2: Food Chemistry	3

No.	Objectives / CLOs	Expected Skills / Knowledge			PLOs
		Specific	Generic	Knowledge	
8.3	Students will be able to write understandable laboratory reports after performing experiments นักศึกษาสามารถเขียนรายงานผลการทดลองทางวิทยาศาสตร์ภายหลังจากทำการทดลองได้อย่างเข้าใจ	S13: Skill in report writing and presentation of research project	G13: Writing skill	K23: Writing scientific report	3
8.4	Students will be able to work as a team with ethics นักศึกษาสามารถทำงานเป็นทีมอย่างมีจริยธรรม		G3: Ethics G15: Interpersonal skill G16: Teamwork		5

## 9. Class Instructor List

9.1	Associate Professor Dr. Rungtiwa Wongsagornsup	(RW)	Email: kookple@hotmail.com
9.2	Dr. Amnart Jarerat	(AJ)	Email : amnart.jar@mahidol.ac.th
9.3	Dr. Jarupat Luecha	(JL)	Email: jarupat.lue@mahidol.edu
9.4	Dr. Natteewan Udomsilp	(NU)	Email: paeng888@hotmail.com
9.5	Dr. Chutikarn Kapcum	(CK)	Email: kapcum.chu@gmail.com
9.6	Dr. Jetsada Paenak	(JP)	Email: jetsada2004@hotmail.com
9.7	Mrs. Amphak Ekjith	(AE)	Email: namleab3@hotmail.com
9.8	Miss Kannika Pasada	(KP)	Email: kannika.pas@mahidol.ac.th
9.9	Miss Janjira Sratongyung	(JS)	Email: janjira.sra@mahidol.ac.th

## 10. Course Outline Lecture (all day lecture)

Week	Date	Time	Contents	CLOs	Instructor
1	13 Aug 2020	9.00-12.00	Lecture: Introduction to course Water and water activity 1	8.1	CK RW
		13.00-16.00	Lecture: Water and water activity 2	8.1	RW
2	20 Aug 2020	9.00-12.00	Lecture: Mono- and oligo-saccharides	8.1	RW
		13.00-16.00	Lecture: Polysaccharides and starch	8.1	RW
3	27 Aug 2020	9.00-12.00	Lecture: Enzyme 1	8.1	AJ
		13.00-16.00	Lecture: Enzyme 2	8.1	AJ
4	3 Sep 2020	9.00-12.00	Lecture: Protein 1	8.1	JL
		13.00-16.00	Lecture: Protein 2	8.1	JL
5	10 Sep 2020	9.00-12.00	Lecture: Maillard Browning	8.1	NU
		13.00-16.00	Lecture: Pigment	8.1	JL

Week	Date	Time	Contents	CLOs	Instructor
6	17 Sep 2020	9.00-12.00	Lecture: Fat and lipid 1	8.1	CK
		13.00-16.00	Lecture: Fat and lipid 2	8.1	CK
7	24 Sep 2020	9.00-12.00	Lecture: Dispersed system 1	8.1	CK
		13.00-16.00	Lecture: Dispersed system 2	8.1	CK
8	1 Oct 2020	9.00-12.00	Lecture: Vitamin and mineral	8.1	CK

#### Course Outline Lab (all day lab)

Week	Date	Contents	CLOs	Instructor
10	15 Oct 2020	Lab: Water activity, hydrometer, hand refractometer	8.2,8.3, 8.4	RW, CK, AE, KP
		Lab: COD of waste water	8.2,8.3, 8.4	JP, AE, KP
21 Oct 2020 Mid -term Examination (week 1-3) at 13.30-16.30 pm				
11	22 Oct 2020	Lab: Total CHO and reducing sugar	8.2,8.3, 8.4	RW, AE, KP
		Lab: Pigment in foods	8.2,8.3, 8.4	CK, AE, KP
12	29 Oct 2020	Lab: Amylose content	8.2,8.3, 8.4	RW, AE, KP
		Lab: Acid value and free fatty acid	8.2,8.3, 8.4	CK, AE, KP
13	5 Nov 2020	Lab: Starch Granules, swelling and solubility	8.2,8.3, 8.4	RW, AE, KP, JS
		Lab: Peroxide value in food	8.2,8.3, 8.4	CK, AE, KP
11 Nov 2020 Extra - Examination (week 4-5) at 13.30-16.30 pm				
14	12 Nov 2020	Lab: Effects of heat and pH on water holding capacity of muscle protein	8.2,8.3, 8.4	JL, AE, KP
		Lab: Vitamin C in Foods	8.2,8.3, 8.4	RW, AE, KP
15	19 Nov 2020	Lab: Maillard Browning	8.2,8.3, 8.4	NU, AE, KP
		Lab: Properties of emulsions	8.2,8.3, 8.4	CK, AE, KP
16	26 Nov 2020	Lab: Egg Foam	8.2,8.3, 8.4	JL, AE, KP
		Lab: Polyphenol Oxidase	8.2,8.3, 8.4	AJ, AE, KP
17	3 Dec 2020	Lab: Wrap up and Lab Test	8.2,8.3, 8.4	JL, CK, AE, KP
9 Dec 2020 Final - Examination (week 6-8) at 13.30-16.30 pm				

For laboratory study, 4 students per group will be working together throughout the semester.

There will be 8 groups in total.

## 11. Course Assessment

No.	Methods / Activities	Regulations	CLOs	Week	Weight Distribution (%)
11.1	Mid-term closed book examination	3 hours	8.1	1-3	24
11.2	Extra closed book examination	3 hours	8.1	4-5	16
11.3	Final closed book examination	3 hours	8.1	6-8	20
11.4	14 Lab reports using rubrics	After class	8.3	1-16	20
11.5	Lab quizzes and tests	In class	8.2	1-16	10
11.6	Affective score	In class	8.2, 8.4	1-16	3
11.7	Chemical preparation	After class	8.2	1-16	4
11.8	Lecture class attendant*	In class	8.2	1-16	3
				<b>Total</b>	<b>100</b>

\*Students who have less than 80% class attention, will not be allowed to take final examination.

## 12. Grading System

Criterion-referenced evaluation

Grade	Score	Grade	Score	Grade	Score	Grade	Score
A	≥ 80 %	B	70 – 74.99%	C	60 – 64.99%	D	50 – 54.99%
B+	75 – 79.99%	C+	65 – 69.99%	D+	55 – 59.99%	F	< 50 %

Norm-referenced evaluation

\*If use both criterion and norm-referenced evaluation, please tick two boxes.

## 13. References

- 13.1 นิธิยา รัตนापนนท์. 2549. เคมีอาหาร. พิมพ์ครั้งที่ 2. สำนักพิมพ์ไอเดียนส์โตร์, กรุงเทพฯ.
- 13.2 Belitz, H.-D., W.Grosch and P.Schieberle. 2004. Food Chemistry. 3rd revised ed. Springer, Berlin.
- 13.3 Damadaran, S., K.L. Parkin and O.R. Fennema. 2008. Fennema's Food Chemistry. 4th ed. CRC Press/Taylor & Francis, Boca Raton.
- 13.4 Hui, Y.H. 2006. Food Biochemistry & Food Processing. Blackwell Publishing, Iowa.