



## Course Syllabus (Academic Year 2022)

School of Interdisciplinary Studies, Kanchanaburi Campus, Mahidol University

1. **Course No. and Title** : KAFT451 Shelf Life Studies of Food Product  
**Credit (study hours)** : 2(1-3-3)
2. **Program Name** : Bachelor of Science in Food Technology
3. **Course Module** : Specialized/Specific core course  
**Pre/co-requisite** : KAFT 325, KAFT 352 and KAFT 342
4. **Class Semester** :  1<sup>st</sup> Semester  2<sup>nd</sup> Semester Academic Year 2022
5. **Class Schedule & Venue** : Lecture Tuesday, 08:00AM–9:00AM, Room: R - L216  
 Laboratory Tuesday, 9:00AM-12:00 PM, Room: R - L112, L305  
 Hybrid class via Webex online
6. **Class Coordinator (CC)** : Patnarin Benyathiar, Ph.D.  
 Room : L220 (Laboratory Building) Email : patnarin.ben@mahidol.ac.th
7. **Course Description**  
 Concept, methodology and applications of shelf life study; physical deterioration, chemical deterioration, and microbial deterioration; and factors effecting shelf-life of food products (product composition, packaging, and storage and distribution)
8. **Course Objectives / Course Learning Outcomes (CLOs)**

No.	Objectives / CLOs	Expected Skills / Knowledge*			PLOs**
		Specific	Generic	Knowledge	
8.1	Explain the principle; and discuss importance of shelf life determination of food products	S8: Skill in judging food quality based on provided data	G1, G4	K5, K19	PLO1
8.2	Classify modes of deterioration of specific food; and identify factors affecting its shelf life	S5: Skill in identifying important characteristics of food	G4	K5, K19	PLO1
8.3	Design shelf life testing plan for particular food product; and execute accordingly				
	8.3.1 Design scientifically sound experimental plan on shelf life testing	S10: Skill in experimental planning	G1, G7	K5, K19, K22	PLO2
	8.3.2 Competently execute scientific experiment	S11: Skill in conducting experiment	G3, G7, G9, G15-17	K8, K17-19, K27	PLO2, PLO 3
	8.3.3 Interpret obtained results correctly	S8: Skill in judging food quality based on provided data	G1, G4	K5, K7, K19, K21	PLO3

No.	Objectives / CLOs	Expected Skills / Knowledge*			PLOs**
		Specific	Generic	Knowledge	
	8.3.4 Efficiently communicate scientific findings	S13: Skill in report writing and presentation of research project	G4, G10, G13, G14	K19, K23, K24	PLO4, PLO 5

\* G1: Decision making; G2: Information acquisition; G3: Ethics; G4: Associating skill; G5: Business awareness; G6: Cultural awareness; G7: Time management; G8: Computer skill/IT; G9: Problem solving; G10: Communication skill; G11: Leadership; G12: Live-long learning; G13: Writing skill; G14: Presentation skill; G15: Interpersonal skill; G16: Teamwork; G17: Self-direction; K1: Post harvest handling of agricultural materials; K2: Food chemistry; K3: Food processing; K4: Food biochemistry; K5: Food laws/std. regulations (HACCP); K6: Food engineering; K7: Food safety; K8: Food microbiology; K9: QC&QA (Stat. for QC); K10: Food sanitation; K11: Logistic; K12: Sustainability; K13: Waste management; K14: Global & national trend & policy; K15: Business administration; K16: Physical properties of food; K17: Analysis of food properties; K18: Sensory; K19: Shelf-life estimation; K20: Stat. (sampling); K21: Stat. (data analysis); K22: Experimental design; K23: Scientific writing; K24: Scientific presentation (media preparation); K25: Thai language for communication; K26: English language for communication; K27: Psychology; K28: Human nutrition

\*\*PLO1: Control and problem-solve food production process at industrial level using fundamentals in food science and technology with intellectual curiosity; PLO2: Apply knowledge of food science and technology at managerial level for controlling food quality; PLO3: Apply scientific principles and methods to carry out research project related to food science and technology, including planning, implementation, collecting data and drawing valid conclusions; PLO4: Communication in Thai and English effectively in food science and technology contexts with wide-range of audiences; PLO5: Demonstrate the ability to work independently, as well as the ability to work cooperatively in teams with ethical awareness

## 9. Class Instructor

Dr. Amnat Jarerat (AJ)

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Dr. Chutikarn Kapcum (CK)

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Dr. Patnarin Benyathiar (PB)

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Dr. Renoo Yenket (RYK)

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### Staff from Science Laboratory for Education Division (SLE)

Kannika Pasada (KP)

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### Invited lecturer

Associate Professor Dharmendra Mishra (DM)

Email: mishradh@purdue.edu

## 10. Course Outline

Week	Date	Contents	CLOs	Instructor's Names
1	Aug 9, 2022 Lecture: 8:00-12:00 น.  No Lab	<ul style="list-style-type: none"> <li>Course introduction</li> <li>Factor of food deterioration</li> <li>Deterioration of foods</li> <li>Packaging and Shelf life</li> </ul>	1,2	PB
2	Aug 16, 2022 Lecture: 8:00-11:00 น.	<ul style="list-style-type: none"> <li>Shelf-life deterioration of fresh produce</li> <li>Shelf-life deterioration of dry food</li> <li>Shelf-life deterioration of beverage</li> </ul>	1,2	PB
	Lab: 11:00-12:00 น.	<ul style="list-style-type: none"> <li>Laboratory Introduction/objective/scope</li> </ul>	1,2	PB, KP

3	Aug 23, 2022 Lecture: 8:00-11:00 น.	<ul style="list-style-type: none"> <li>• Shelf-life deterioration of snack food</li> <li>• Shelf-life deterioration of confectionary/bakery</li> <li>• Shelf life methodology and standard</li> </ul>	1,2	PB
	Lab: 11:00-12:00 น.	<ul style="list-style-type: none"> <li>• Group project concept, discussion &amp; plan</li> </ul>	2,3	PB, KP
4	Aug 30, 2022 Lecture: 8:00-9:00 น.	<ul style="list-style-type: none"> <li>• Shelf-life testing methodology: Physical deterioration</li> </ul>	1,2	DM, PB
	Lab: 9:00-12:00 น.	<ul style="list-style-type: none"> <li>• Proposal workshop (Writing &amp; Rubric)</li> </ul>	2,3	PB, KP
5	Sept 6, 2022 Lecture: 8:00-9:00 น.	<ul style="list-style-type: none"> <li>• Shelf-life testing methodology: Chemical deterioration</li> </ul>	1,2	CK
	Lab: 9:00-12:00 น.	<ul style="list-style-type: none"> <li>• Experimental design &amp; Testing preparation</li> <li>• Submit Class project topic</li> </ul>	2,3	PB, KP
6	Sept 13, 2022 Lecture: 8:00-9:00 น.	<ul style="list-style-type: none"> <li>• Shelf-life testing methodology: Microbial deterioration</li> </ul>	1,2	AJ
	Lab: 9:00-12:00 น.	<ul style="list-style-type: none"> <li>• Team brainstorm &amp; Proposal preparation</li> </ul>	2,3	PB, KP, AJ, CK, RYK
7	Sept 20, 2022 Lecture: 8:00-9:00 น.	<ul style="list-style-type: none"> <li>• Shelf-life testing methodology: Sensory</li> </ul>	1,2	RYK
	Lab: 9:00-12:00 น.	<ul style="list-style-type: none"> <li>• Student's group presentation on shelf life testing plan (proposal presentation)</li> </ul>	1-3	PB, KP, AJ, CK, RYK
8	Sept 27, 2022 Lecture: 8:00-9:00 น.	<ul style="list-style-type: none"> <li>• Shelf life estimation &amp; modeling</li> </ul>	1,2	DM, PB
	Lab: 9:00-12:00 น.	<ul style="list-style-type: none"> <li>• Project concept refinement &amp; group debriefing</li> </ul>	1-3	PB, KP, AJ, CK, RYK
9	Oct 4, 2022 8:00-12:00 น.	<b>Midterm examination (TBD)</b>		
10	Oct 11, 2022 Lab: 8:00-12:00 น.	<ul style="list-style-type: none"> <li>• Group project work</li> </ul>	1-3	PB, KP, AJ, CK, RYK
11	Oct 18, 2022 Lab: 8:00-12:00 น.	<ul style="list-style-type: none"> <li>• Team meeting + Consult hour (30 min)</li> </ul>	1-3	PB, KP, AJ, CK, RYK
12	Oct 25, 2022 Lab: 8:00-12:00 น.	<ul style="list-style-type: none"> <li>• Team meeting + Consult hour (30 min)</li> </ul>	1-3	PB, KP, AJ, CK, RYK
13	Nov 1, 2022 Lab: 8:00-12:00 น.	<ul style="list-style-type: none"> <li>• Team meeting + Consult hour (30 min)</li> </ul>	1-3	PB, KP, AJ, CK, RYK
14	Nov 8, 2022 Lab: 8:00-12:00 น.	<ul style="list-style-type: none"> <li>• Team meeting + Consult hour (30 min)</li> <li>• Project wrap up/Lab Cleaning/Write the preport</li> </ul>	1-3	PB, KP, AJ, CK, RYK
15	Nov 15, 2022 8:00-12:00 น.	<p style="text-align: center;">Oral Presentation <b>all students are required to attend</b></p>	1-3	PB, KP, AJ, CK, RYK
16	Nov 22, 2022 8:00-12:00 น.	<p style="text-align: center;">Oral Presentation <b>all students are required to attend</b></p>	1-3	PB, KP, AJ, CK, RYK
17	Nov 29, 2022	<b>Final report submission</b>		

### 11. Course Assessment

No.	Methods / Activities	Regulations	CLOs	Week	Weight Distribution (%)
11.1	Midterm examination	Rubric, by class instructor	1, 2	9	20%
11.2	Team project proposal	Rubric, by class instructor	1-3	2-5	10%
11.3	Proposal presentation	Rubric, by class instructor	2, 3	6	10%
11.4	Weekly update participation	Rubric, by class instructor	3	6-14	10%
11.5	Final project written report	Rubric, by class instructor	2, 3	17	20%
11.6	Oral presentation	Rubric, by class instructor	2, 3	17	20%
11.7	Peer evaluation	Instructor's observation	3	2-16	10%
				<b>Total</b>	<b>100</b>

### 12. Grading System

Criterion-referenced evaluation

Class' average score < 75.00 %		Class' average score $\geq$ 75.00%	
Grade	Score	Grade	Score
A	$\geq$ 80.00 %	A	$\geq$ 85.00 %
B+	75.00 – 79.99%	B+	80.00 – 84.99%
B	70.00 – 74.99%	B	75.00 – 79.99%
C+	65.00 – 69.99%	C+	70.00 – 74.99%
C	60.00 – 64.99%	C	65.00 – 69.99%
D+	55.00 – 59.99%	D+	60.00 – 64.99%
D	50.00 – 54.99%	D	55.00 – 59.99%
F	< 50.00 %	F	< 55.00 %

Norm-referenced evaluation

### 13. References

- Robertson GL, editor. Food Packaging and Shelf Life: A Practical Guide. New York: CRC Press. 2010.
- Smith JS and Hui YH, editors. Food Processing: Principles and Applications, Boston: Blackwell Publishing. 2004.