Course Syllabus (Academic Year 2019)

School of Interdisciplinary Studies, Kanchanaburi Campus, Mahidol University

1. **Course No. and Title** : KAFT 215 Food Engineering I

   Credit (study hours) : 3 (3-0-6)

2. **Program Name** : Bachelor of Science in Food Technology

3. **Course Module** : Specific Core Course

   Pre-requisite : None

4. **Class Semester** : ☐ 1st Semester ☑ 2nd Semester Academic Year 2020

5. **Class Schedule & Venue** : Lecture every Thursday at 13.00-16.00, Room L-218

6. **Class Coordinator** : Assoc. Prof. Dr. Rungtiwa Wongsagonsup

   Contact No. : 082-470-7341 E-mail : rungtiwa.won@mahidol.ac.th

7. **Course Description**

   Mass and energy balance; fluid mechanics; heat transfer; mass transfer; self-responsibility; work effectively with others

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

No.	Objectives / CLOs	Expected Skills / Knowledge			PLOs
		Specific	Generic	Knowledge	
8.1	Explain the basic principle including mass and energy balance, law in fluid mechanics, heat and mass transfer which occur in food processing อธิบายหลักการพื้นฐานเกี่ยวกับสมดุลมวลและพลังงาน กฎของกลศาสตร์ของไหล การถ่ายเทความร้อนและมวลที่เกิดขึ้นในกระบวนการแปรรูปอาหาร	S2	G9	K6	1
8.2	Calculate and solve the transport process problems associated with food processing operations คำนวณและแก้ปัญหาของกระบวนการขนส่งที่เกี่ยวข้องกับปฏิบัติการแปรรูปอาหาร	S2	G9	K6	1

9. Class Instructor List

9.1 Name : Dr. Jeerun Kingkeaw (JK) Email : atomic_jee@yahoo.com

10. Course Outline

Week	Date	Contents	CLOs	Teaching & Learning	Instructor's Names
1	21/01/21	Course introduction & Introduction to unit operations	8.1, 8.2	- Lecture and discussion - Assignment	JK
2	28/01/21	Dimension and engineering units, Unit conversions, Concepts and basic principles for food engineering	8.1, 8.2		JK
3	04/02/21	Material (mass) balance	8.1, 8.2		JK
4	11/02/21	Energy/heat/work & Energy balances	8.1, 8.2		JK
5	18/02/21	Fluid mechanics I : Properties of fluid & Fluid statics and fluid dynamics	8.1, 8.2		JK
6	25/02/21	Fluid Mechanics II : Continuity equation, Energy equation, Bernoulli's equation & Energy losses in flow	8.1, 8.2		JK
7	04/03/21	Pump selection & Flow measurement	8.1, 8.2		JK
8	11/03/21	Compressible Flow & Flow around Submerged Objects	8.1, 8.2		JK
9	Mid-term Examination (15-19/03/21)				
10	25/03/21	Introduction to heat and mass transfer & Heat conduction I	8.1, 8.2	- Lecture and discussion - Assignment	JK
11	01/04/21	Heat conduction II & Heat convection I	8.1, 8.2		JK
12	08/04/21	Heat convection II & Heat Radiation	8.1, 8.2		JK
13	15/04/21* (สอนชดเชย 21/04/21)	Unsteady state heat transfer & Heat Exchanger I	8.1, 8.2		JK
14	22/04/21	Heat Exchanger II	8.1, 8.2		JK
15	29/04/21	Mass transfer I : Principles of mass transfer	8.1, 8.2		JK
16	06/05/21	Mass transfer II : Convective mass transfer, Unsteady state mass transfer	8.1, 8.2		JK
17-18	Final Examination (10-21/05/21)				

*** Songkran day**

11. Course Assessment

No.	Methods / Activities	Regulations	CLOs	Week	Weight Distribution (%)
11.1	Mid-term exam	- Open book (1 A4) - Calculator is allowed	8.1	1-8	40
11.2	Final exam	- Open book (1 A4) - Calculator is allowed	8.2	10-16	40
11.3	Quiz/Assignment	Individual and group assignments	8.1, 8.2	2-8, 10-16	15
11.4	Class participation	Instructor evaluation of class participation		1-8, 10-16	5
				Total	**100**

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 Singh, R.P. and Heldman, D.R. Introduction to Food Engineering. 4th Edition. Printed in china: Academic Press is an imprint of Elsevier, 2009.

13.2 Earle, R.L. Unit Operations in Food Processing - the Web Edition. [Online]. 2003. Available from: http://www.nzifst.org.nz/unitoperations.