Course Syllabus (Academic Year 2021)

Food Technology Program, Kanchanaburi Campus, Mahidol University

1. **Course No. and Title** : KAFT 210 Physical Chemistry

   Credit (study hours) : 2 (2-0-4)

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

3. **Course Module** : Core course (Basic science)

   Pre/co-requisite : SCCH 104

4. **Class Semester** : ☑ 1st Semester ☐ 2nd Semester Academic Year 2021

5. **Class Schedule & Venue** : **Wenesday online via Webex**

   From 9:00- 11:00

6. **Class Coordinator** : Dr. Jarupat Luecha

   Email: jarupat.lue@mahidol.edu

7. **Course Description**

Conservation of energy; spontaneous reactions; entropy and free energy; the concentration dependence of free energy; physical equilibria; transport phenomena; kinetics and enzyme kinetics

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

No.	Objectives / CLOs	Expected Skills / Knowledge			PLOs
		Specific	Generic	Knowledge	
8.1	Students will be able to describe basic principle of physical chemistry.	-	G13: Writing skill	Basic science course	1
8.2	Student will be able to explain nature and phenomena of biological systems using basic knowledge related to physical chemistry.	-	G4: Associating skill	Basic science course	1

9. **Class Instructor List**

   9.1 Dr. Sukhum Poommarinvarakul (SP) Tel 0815599521 Email: Sukhum_acp@hotmail.com

   อาจารย์ สุขุม ภุมรินทร์วรากุล

10. Course Outline

Week	Date	Contents	CLOs	Teaching & Learning Method	Instructor
1	11 Aug 2021	Course introduction, Fundamental to physical chemistry (Atoms, Molecules, Unit and Unit Conversion)	8.1, 8.2	Lecturing, discussion, homework and assignment	SP
2	18 Aug 2021	Equilibrium: Intensive and extensive properties of matters, Properties of gas			SP
3	25 Aug 2021	Equilibrium: The first law of thermodynamics (Conservation of Energy, Work, Heat, Internal Energy)			SP
4	1 Sep 2021	Equilibrium: The first law of thermodynamics (Enthalpy change)			SP
5	8 Sep 2021	Equilibrium: The second law of thermodynamics (Spontaneous change, Entropy)			SP
6	15 Sep 2021	Equilibrium: The second law of thermodynamics (Gibbs free energy)			SP
7	22 Sep 2021	Equilibrium: Phase change and phase diagram			SP
8	29 Sep 2021	Equilibrium: Properties of mixture solutions and phase diagram of binary system			SP
9	6 Oct 2021	Gibbs free energy in biochemistry, Thermodynamics in living systems, Bioenergetic			SP
10	Mid-term Examination (11-15 Oct 2021 At Kanchanaburi Campus)				
11	20 Oct 2021	Transport phenomena: Momentum transport	8.1, 8.2	Lecturing, discussion, homework and assignment	SP
12	27 Oct 2021	Transport phenomena: Energy transport			SP
13	3 Nov 2021	Transport phenomena: Mass transport			SP
14	10 Nov 2021	Kinetics: Rate of chemical reaction			SP

15	17 Nov 2021	Kinetics: Order of a reaction			SP
16	24 Nov 2021	Kinetics: Catalyst and Enzyme			SP
17	Final Examination (29 Nov-9 Dec 2021 At Kanchanaburi Campus)				

11. Course Assessment

No.	Methods / Activities	Regulations	CLOs	Week	Weight Distribution (%)
11.1	Mid-term exam offline At Kanchanaburi Campus	☑ Content (Week 1-8) ☑ Opened book ☑ Faculty-approved calculator	8.1-8.2	1-8	30
11.2	Final exam offline At Kanchanaburi Campus	☑ Content (Week 10-16) ☑ Opened book ☑ Faculty-approved calculator		10-16	30
11.3	Quiz	Week 1-8		1-16	10
		Week 10-16			10
11.4	Homework/assign ments	Week 1-8		1-16	7.5
		Week 10-16			7.5
11.5	Class participation	Student must attend a class more than 80% of the whole course.		1-16	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 %

13. References (recommended)

13.1 Atkins, P. and DePaula, J. (2001) Physical chemistry. 7th ed. W. H. Freeman publishing.