



Course Syllabus (Academic Year 2021)

School of Interdisciplinary Studies, Kanchanaburi Campus, Mahidol University

- Course No. and Title** : KAID 222 Analytical Chemistry
Credit (study hours) : 2(2-0-1)
- Program Name** : Bachelor of Science in Food Technology
Course Module : Specific Requirement Course
Pre-requisite : SCCH 136 General Chemistry II
Co-requisite : -
- Class Semester** : 1st Semester 2nd Semester Academic Year 2021
- Class Schedule & Venue** : Tuesday 11:00 – 13:00, Cisco WebEx online platform

Meeting link:

<https://mahidol.webex.com/mahidol/j.php?MTID=m3a0d14f50fbf4e5bb8c3320425308aad>

Meeting number : 158 178 7330

Password : KAID222(64-Tu)

Thursday 13:30 – 16:30, Cisco WebEx online platform

Meeting link:

<https://mahidol.webex.com/mahidol/j.php?MTID=me8b671f177950cf075abc73537a430e6>

Meeting number : 158 295 6519

Password : KAID222(64-Thu)

Class Coordinator : Asst. Prof.Dr. Waraporn Threeprom

Contact No. : 083-7784445 Email : wthreeprom@yahoo.com

5. Course Description

Fundamental knowledge of chemical analysis both qualitative and quantitative; calculations: concentration, buffer, error, accuracy, precision, statistics; chemical equilibria and electrolyte; quantitative analysis by titration and by calibration; molecular absorption spectrometry: UV-Visible; atomic absorption spectrometry; atomic emission spectrometry; potentiometric method: ion-selective electrode and pH measurement; high performance liquid chromatography; gas chromatography;

Course Objectives / Course Learning Outcomes (CLOs)

No.	Objectives / CLOs	Expected Skills / Knowledge			PLOs
		Specific	Generic	Knowledge	
8.1	Understanding the important terms and definitions	Chemistry, Statistic Mathematic	English Language, Information technology	Basic chemistry	Understand
8.2	Explaining the volumetric methods and instrumental methods for analysis	Chemistry	English Language, Information technology	Basic analytical chemistry	Explain
8.3	Applying knowledge to solve the basic problem in qualitative and quantitative analysis	Chemistry	English Language, Information technology	Basic analytical chemistry	Apply
8.4	Analysis and selecting analytical methods	Chemistry	English Language, Information technology	Basic analytical chemistry	Analysis

6. Class Instructor List

6.1 Name : Asst. Prof. Dr. Waraporn Threeprom (WT) Contact No. : 083-7784445

Email : wthreeprom@yahoo.com

6.2 Name : Asst. Prof. Dr. Nongnuch Sungayuth (NS) Contact No. : 083-6356441

Email : nongnuchts@gmail.com

7. Course Outline

Week	Date	Contents	CLOs	Teaching & Learning	Instructor's Names
1	17/08/21	Important and role of analytical chemistry Definition and Fundamental of Quantitative and Qualitative analysis Steps in Quantitative analysis and sampling	8.1	Lecture, Group discussion, Group assignment	WT
	19/08/21	Definition of important term Error Accuracy and Precision Determinate and Indeterminate error Method validation	8.1, 8.2	Lecture, Group discussion, Homework, Quiz	WT
2	24/08/21	Gravimetric method	8.2, 8.3	Lecture, Group discussion, Homework, Quiz	WT
	26/08/21	Volumetric method Standard solution preparation Concentration system Chemical equilibria	8.2, 8.3	Lecture, Group discussion, Homework, Quiz	WT
3	31/08/21	Acid-base titration Acid-base equilibrium Indicator for acid-base titration Buffer preparation	8.2, 8.3, 8.4	Lecture, Group discussion, Homework, Quiz	WT

	02/09/21	Redox titration Indicator for redox titration Oxidizing agent and Reducing agent	8.2, 8.3, 8.4	Lecture, Group discussion, Homework, Quiz	WT
4	07/09/21	Complexometric titration Indicator for complexometric titration	8.2, 8.3, 8.4	Lecture, Group discussion, Homework, Quiz	WT
	09/09/21	Precipitation titration Indicator for precipitation titration	8.2, 8.3, 8.4	Lecture, Group discussion, Homework, Quiz Group assignment	WT
5	14/09/21	Electrochemistry Potentiometric method Conductivity method	8.2, 8.3, 8.4	Lecture, Group discussion, Homework, Quiz	NS
	16/09/21	Spectroscopy Beer's law UV-Visible spectrometry	8.2, 8.3, 8.4	Lecture, Group discussion, Homework, Quiz	NS
6	21/09/21	Atomic absorption spectrometry	8.2, 8.3, 8.4	Lecture, Group discussion, Homework, Quiz	NS
	23/09/21	Atomic emission spectrometry	8.2, 8.3, 8.4	Lecture, Group discussion, Homework, Quiz	NS
7	28/09/21	Liquid chromatography	8.2, 8.3, 8.4	Lecture, Group discussion, Homework, Quiz	NS

	30/09/21	Gas chromatography	8.2, 8.3, 8.4	Lecture, Group discussion, Homework, Quiz	NS
8	4-8 October 2021 Final Examination (3 hrs. online)				

8. Course Assessment

No.	Methods / Activities	Regulations	CLOs	Week	Weight Distribution (%)
11.1	Quiz	Correct answer	8.2	1-7	20
11.2	Final exam	On-line examination	8.2, 8.3, 8.4	8	50
11.3	Group Reports / Assignments	Complete and On time	8.1, 8.2, 8.3	1, 4	10
11.4	Personal homework	Complete and On time	8.1, 8.2	2-7	20
				Total	100

9. 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.

10. References

10.1 ศุภชัย ใช้เทียมวงศ์ : เคมีวิเคราะห์ , ปีที่พิมพ์ 13/2555.

10.2 Gary D. Christian, Analytical Chemistry, 6th edition, 2004.

10.3 Douglas A. Skoog, Donald M. West, F. James Holler, Stanley R. Crouch, Fundamental of Analytical Chemistry, 9th edition, 2014.

10.4 เอกสารประกอบการสอนหัวข้อ แก๊สโครมาโทกราฟี โดย อาจารย์ ดร.วราภรณ์ ตรีพรหม