

# SCCT 231 Chemical Dynamics in Industrial Applications

Semester 1 Academic year 2025

Date Tuesday 1.30-4.30 PM

Room **SC2-323**

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Google classroom (for uploading the lecture materials/assignment)

Invite link: <https://classroom.google.com/c/NzAwMzlyNjA2NDM3?cjc=xgega3r5>

Class code: xgega3r5

## Course description

To provide students with knowledge in chemical dynamics in industrial applications and enable them to predict reaction rates under various given conditions, based on the physical properties (temperature, pressure, concentration, etc.) of the substances involved in the reaction. Understand general techniques in chemistry and experiments related to the content with the theoretical aspects of the subject. Additionally, the course aims to develop students' skills in communicating knowledge of physical chemistry and to encourage the expression of responsibility.

## Measurement and evaluation

Score (100):	Homework/Quiz/Assignment	20%
	Mini Exam	20%
	Midterm Exam	20%
	Final Exam	20%
	Lab Practice	20%

**Note:** This student evaluation is in accordance with the rules and regulations of the Faculty of Science, Mahidol University

Criteria and conditions for measurement and evaluation are to be enforced in accordance with Mahidol University Regulation on Diploma and Undergraduate Study and recent announcement, the Faculty of Science on Undergraduate Study, by using symbols showing results with assigned scores as shown in the table:

Score (percentage)*	Symbols
80 – 100	A
70 – 79	B+
65 – 69	B
60 – 64	C+
55 – 59	C
50 – 54	D+
40 – 49	D
< 49	F

\*Note Grading criteria could be changed from the given table. Other grading evaluation based on number of student and total score distribution of that course could be assessed to assigned symbol-based student's score using normal distribution curve on mean and standard deviation.

No	Date	Topics	Instructor
1	August 5, 2025	<b>The Rates of Chemical Reactions:</b> <ul style="list-style-type: none"> <li>The Rate of a Reaction</li> <li>Rate Law</li> <li>Rate Constant</li> </ul>	Suarwee Akavipat
2	August 12, 2025	-No class-	
3	August 19, 2025	<ul style="list-style-type: none"> <li>Molecularity</li> <li>Integrate Rate Law</li> <li>Half-life</li> </ul>	
4	August 26, 2025	<b>Lab Practice:</b> Kinetic Decomposition of Murexide	
5	September 2, 2025	<b>Mini Exam I</b>	
6	September 9, 2025	<ul style="list-style-type: none"> <li>Arrhenius equation</li> </ul>	
7	September 16, 2025	<b>Lab Practice:</b> Hydrolysis of Methyl Acetate (part 1)	
8	September 23, 2025	<b>Lab Practice:</b> Hydrolysis of Methyl Acetate (part 2)	
9	September 29 - October 3, 2025	<b>MIDTERM Examination</b>	
10	October 7, 2025	<b>Overview of kinetic reactions and orders</b> <b>Reaction mechanism:</b> <ul style="list-style-type: none"> <li>Reversible reaction</li> <li>Parallel reactions</li> </ul>	Soraya Pornsuwan
11	October 14, 2025	<b>Consecutive reaction</b> <ul style="list-style-type: none"> <li>Steady-state approximation</li> <li>Unimolecular reactions</li> </ul>	
12	October 21, 2025	<b>Consecutive reaction (continued)</b> <ul style="list-style-type: none"> <li>Steady-state approximation</li> <li>Unimolecular reactions</li> </ul>	
13	October 28, 2025	<b>Enzyme kinetics</b> <ul style="list-style-type: none"> <li>Michaelis-Menten Equation</li> <li>Enzyme behavior analysis/Lineweaver–Burk Plot</li> </ul>	
14	November 4, 2025	<b>Mini Exam II</b>	
15	November 11, 2025	<b>Lab Practice:</b> Kinetics of egg shell reaction	
16	November 18, 2025	<b>Lab Practice:</b> Enzymatic reaction	
17	November 25, 2025	<b>Review</b>	
18	December 1–12, 2025	<b>Final Examination</b>	

**Note:** Depending on the situation, this schedule can be changed or the class will be added up. Please check the announcement from the instructors.

#### Reference:

- Hill, J.W. and Petrucci, R.H. General Chemistry, An Integrated Approach. 3th Edition. USA: Prentice Hall. 2002.
- Atkin, P.W. Atkin's Molecules. 2nd Edition. UK: Cambridge University Press. 2003.
- Middlecamp, C.H. et al. Chemistry in Context: Applying Chemistry to Society. 7th Edition., USA: McGraw-Hill. 2012.
- Chang, R. Chemistry. 13th Edition. New York: McGraw-Hill, 2017.