

COURSE SYLLABUS

1. **Program of Study** Bachelor of Science (Chemistry)
Faculty International College, Mahidol University
2. **Course Code** ICCH 335
Course Title Physical Chemistry III
3. **Number of Credits** 4 (4-0-8) (**Lecture/Lab/Self-study**)
4. **Prerequisites** ICCH 334
5. **Type of Course** Elective major courses
6. **Semester / Academic Year:**
Third trimester 2006-2007
7. **Course Conditions:** Number of students between 20-30
8. **Course Description:**
A detailed and highly mathematical study of chemical spectroscopy and molecular statistics.
9. **Course Objectives:**
After successful completion of this course, students should be able to
9.1 understand detailed concepts of chemical spectroscopy and thermodynamics;
9.2 integrate the concept of molecular statistics to thermodynamics understanding;
9.3 apply concepts to research in physical chemistry.

10. Course Outline

Week	Topics	Hours			Instructor
		Lecture	Lab	Self-study	
1	Emission and absorption spectra	2	-	4	Dr. Supachai Supaluknari
2	Atomic spectra Pure rotational spectra of molecules	4	-	8	Dr. Supachai Supaluknari
3	Vibrational-rotational spectra of molecules Raman spectra	4	-	8	Dr. Supachai Supaluknari
4	Electronic spectra Electron spin resonance	4	-	8	Dr. Supachai Supaluknari
5	Nuclear magnetic resonance	4	-	8	Dr. Supachai Supaluknari

	Molecular statistics				
6	Boltzmann Distribution Law Maxwell-Boltzmann distributions of speeds	4	-	8	Dr. Supachai Supaluknari
7	Partition function	4	-	8	Dr. Supachai Supaluknari
8	Thermodynamics from partition function	4	-	8	Dr. Supachai Supaluknari
9	Partion function; special cases	4	-	8	Dr. Supachai Supaluknari
10	Energy functions; U, H and G	4	-	8	Dr. Supachai Supaluknari
11	Equilibrium constant calculations	4	-	8	Dr. Supachai Supaluknari
12	Equilibrium constant calculations	2	-	4	Dr. Supachai Supaluknari
	Total	44	-	88	

11. Teaching Methods:

- 11.1 Lecturing
- 11.2 Self-study
- 11.3 Group discussion and presentation

12. Teaching Media:

Transparencies, handouts and lecturing from boards.

13. Measurement and Evaluation Student Achievement:

Student achievement is measured and evaluated by

- 13.1 the ability in understanding detailed concepts of chemical spectroscopy and thermodynamics;
- 13.2 the ability to integrate the concept of molecular statistics to thermodynamics understanding;
- 13.3 the ability to apply concepts to research in physical chemistry.

Student's achievement will be graded according to the College and University standard using the symbols: A, B+, B, C+, C, D+, D and F. Students must attend at least 80% of the total class hours of this course.

Assessment made from the set-forward criteria: student who gets 85% and above will have Grade A.

- There will be homework assignments. The assignments will not have to be handed in or graded, but will be discussed periodically in class. Failure to do the homework or to discuss the assignments in class may affect the deliberation of the final Grade.
- A suggestive minimum of;

Midterm examination	40%
Final examination	50%
Quizzes	10%

14. Course Evaluation:

- 14.1 Students' achievement as indicated in number 13 above.
- 14.2 Students' satisfaction towards teaching and learning of the course using questionnaires.

15. References:

Levine, I.N. **Physical Chemistry** 5th Edition, USA: McGraw-Hill; 2003.

Atkins, P. and de Paula, J. **Atkins' Physical Chemistry** 7th Edition, UK: Oxford University Press; 2002.

Levine, I.N. **Quantum Chemistry** 5th Edition, USA: McGraw-Hill; 2000.

Atkins, P. and Friedman, R. **Molecular Quantum Mechanics** 4th Edition, UK: Oxford University Press; 2005.

Albert Cotton, F. **Chemical Applications of Group Theory** 3rd Edition, USA: John Wiley & Sons; 1990.

16. Instructors:

Dr. Supachai Supaluknari

17. Course Coordinator:

Dr. Pakorn Bovonsombat

Mahidol University International College, Mahidol University

Telephone: 02-4410595 ext. 1529

E-mail: icpakorn@mahidol.ac.th