

## COURSE SYLLABUS

1. **Program of Study** Bachelor of Science (Chemistry)  
**Faculty** International College, Mahidol University
2. **Course Code** ICCH 311  
**Course Title** Analytical Chemistry I
3. **Number of Credits** 4(3-2-7) (Lecture/Lab/Self-study)
4. **Prerequisite** ICCH 210 or equivalent
5. **Type of Course** Required major course
6. **Semester / Academic Year** First trimester 2005-2006
7. **Course Conditions** Number of students between 20-30
8. **Course Description**  
Techniques of separation and concepts of modern analytical methods essential for quantitative and qualitative characterisation; treatment of analytical data; principles and application of chemical equilibria; electrochemical methods; separation methods.
9. **Course Objectives**  
After successful completion of this course, students should be able to
  - 9.1 understand the techniques of separation and the concepts of modern analytical methods;
  - 9.2 identify and treat analytical data for quantitative and qualitative characterisations;
  - 9.3 apply the techniques to analysis of compounds.

## 10. Course Outline

Week	Topics				Self-study	Instructor
	Lecture/Seminar	Hour	Laboratory practicals *	Hour	Hours	
1	Error in analysis	2	Balance (27A-1) Transfers (27A-2) Aliquot (27A-3) Pipette (27A-4) Buret (27A-5, -6) Sampling (27A-7)	2	5	Dr. Sirirat Chookieng
2	Statistical analysis	4	-	-	8	
3	Chemicals and apparatus	2	Gravimetric analysis (27B-1)	2	5	
4	Chemical equilibrium	4	-	-	8	
5	Equilibria; electrolyte effects	2	Neutralisation titrations (27C-1-10)	2	5	
6	Gravimetric methods of analysis	2	Neutralisation titrations (27C-1-10)	2	5	
7	Titrations	4	-	-	8	
8	Titrations; pH, acids, bases	2	Complex formation (27E)	2	5	
9	Electrochemistry	4	-	-	8	
10	Oxidation / reduction titrations	2	Spectrophotometry (27L-1, -2)	2	5	
11	Potentiometry	4	-	-	8	
12	Potentiometry	2	-	-	4	
	<b>Total</b>	34	-	8	74	

### 11. Teaching Methods:

- 11.1 Lecturing, practical exercises and problem solving through analysis and interpretation of spectra and numerical data.
- 11.2 Self-study
- 11.3 Group discussion and presentation.

### 12. Teaching Media:

Transparencies, handouts and lecturing from boards.

### 13. Measurement and evaluation of student achievement

Student achievement is measured and evaluated by

- 13.1 the ability to display the techniques of separation and the concepts of modern analytical methods;
- 13.2 the ability to identify and treat analytical data for quantitative and qualitative characterisations;
- 13.3 the ability to apply the techniques to analysis of compounds.

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 90% and above will have Grade A.

A suggestive minimum of;

Midterm examination	30%
Final examination	40%
Quizzes	10%
Laboratory performance	20%

### 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

Skoog, D.A., West, D.M., James Holler, F. and Crouch, S.R. **Fundamentals of Analytical Chemistry**, 8<sup>th</sup> Edition, USA: Brooks/Cole; 2004.

Silverstein, R.M., Clayton, G. and Morrill, T.C. **Spectrometric Identification of Organic Compounds** 6<sup>th</sup> Edition, USA: John Wiley & Sons; 2005.

Skoog, D.A., James Holler, F. and Nieman, T.A. **Principles of Instrumental Analysis** 5<sup>th</sup> Edition, USA: Brooks/Cole; 1998.

### 16. Instructors

Dr. Sirirat Chookieng

### 17. Course Coordinator

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