

COURSE SYLLABUS

1. **Name of Curriculum:** Bachelor of Science (Chemistry)
International College, Mahidol University
2. **Course Code:** ICCH 311 **Course Title:** Analytical Chemistry I
3. **Number of Credits:** 4 Credits (**Lecture/lab**) (3-2)
4. **Prerequisites:** ICCH 210 or equivalent
5. **Type of Course:** Required major courses
6. **Semester / Academic Year:**
Trimester 3 /2013-2014
7. **Course Description:**
Introduction to the 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.
8. **Course Objectives:**
The course is designed to introduce the techniques of separation and the concepts of analytical methods for use in molecular structure elucidation.
9. **Course Outlines**

Week	Topics	Hour
1	An Introduction to the course ?A. What is Analytical Chemistry Definition of analytical chemistry 1. The role of analytical chemistry 2. analytical Classifying quantitative methods 3. Typical steps in quantitative analysis 4. Calibration curve	3
2	B. General Concept of Chemical Equilibrium Aqueous solutions and Chemical Equilibria 1. Effect of Electrolytes on Ionic Equilibrium	3
3	Errors in Chemical Analysis of errors Types .1 Evaluating the data .2	3

4	Gravimetric methods of Analysis Properties of precipitates and precipitating agents 1. Drying and ignition of precipitates 2. Applications of gravimetric methods	3
5	Volumetric Analysis Precipitation Titration .1 Titration Curves for Precipitation Reactions Applications of Precipitation Titrations	3
6	Neutralization Titration (Acid/Base .2 (Titration Base Theory-Acid End and equivalence points Standard solutions Volumetric calculations	3
7	3. Neutralization Titration (Acid/Base (Titration Acid/Base indicators on of pH in titration of strongCalculati acids and strong base Buffer solutions Calculating pH in titration of weak acids	3
8	4. Formation Titration-Complex Forming complexes titration using EDTA Complexation Titration methods Employing EDTA	3
9	5. Reduction Titratio-Oxidationn Applying standard reducing agents Applying standard oxidizing agents Potentiometric titration	3
10	Introduction to Spectroscopy Beer-Lambert law Quantitative analysis	3
11	Introduction to Chromatographic separations Solvent Extraction Theories of Elution Chromatography Separations on Columns	3
		33

Laboratory practical:

22

1. Standardization titration
2. Neutralization Titration I,II,III
3. Potentiometric titration I,II
4. Precipitation titration I,II
5. Formation Titration-Complex
6. Redox Titration
7. Spectroscopic technique

10. Teaching Methods:

Lecturing, practical exercises and problem solving through analysis and interpretation of spectra and numerical data.

11. Teaching Media:

Transparencies, handouts and lecturing from boards.

12. Course Achievement:

Assessment made from the set-forward criteria:

Grading scale	Grade	Point
90 - 100	A	4.0
85 - 89	B+	3.5
80 - 84	B	3.0
75 - 79	C+	2.5
70 - 74	C	2.0
65 - 69	D+	1.5
60 - 64	D	1.0
Below 60	F	0

13. Course Evaluation:

A suggestive minimum of;

Midterm examination	35%
Final examination	40%
Laboratory performance/reports	25%

14. References:

Douglas A. Skoog; Donald M. West; F. James Holler, Stanley R. Crouch, Analytical Chemistry, 8th Edition, Saunders College Publishing, 2003.

Daniel C. Harris, Quantitative Chemical Analysis, 8th Edition, W.H. Freeman and Company, W. H., New York, 2010.

Douglas A. Skoog, Principles of Instrumental Analysis 6th Edition, Brooks Cole,
Belmont, CA 2006.

15. Instructors:

Sirirat Choosakoonkriang
Sirirat_157@yahoo.com

16. Course Coordinator:

Pakorn Bavonsombat