

Liverpool John Moores University

Title: General and Quantitative Analytical Chemistry
Status: Definitive
Code: **3502YAUBIO** (127878)
Version Start Date: 01-08-2021

Owning School/Faculty: Pharmacy & Biomolecular Sciences
Teaching School/Faculty: Yunnan Agricultural University

Team	Leader
Katie Evans	Y

Academic Level: FHEQ3 **Credit Value:** 20 **Total Delivered Hours:** 124
Total Learning Hours: 200 **Private Study:** 76

Delivery Options

Course typically offered: Semester 1

Component	Contact Hours
Lecture	95
Practical	25

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS1	Exam for general chemistry	15	2
Exam	AS2	Mid-term exam for general chemistry	5	
Test	AS3	Basic principles of the macroscopic existence of matter	5	
Practice	AS4	Pre-lab work for general chemistry experiments	3	
Practice	AS5	Practical test for general chemistry experiments	10	
Report	AS6	Practical report for general chemistry experiments	10	
Test	AS7	Good laboratory practice for general chemistry experiments	2	
Exam	AS8	Exam for quantitative analytical chemistry	15	2

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS9	Mid-term exam for quantitative analytical chemistry	5	
Test	AS10	Principles of quantitative analytical chemistry methods	5	
Report	AS11	Practical report for quantitative analytical chemistry experiments	15	
Practice	AS12	Practical test for quantitative analytical chemistry experiments	8	
Test	AS13	Experimental conclusion analysis for quantitative analytical chemistry experiments	2	

Aims

The module aims to provide students with an understanding of the basic principles of the macroscopic existence of matter, chemical kinetics, chemical thermodynamics, and chemical equilibrium, in order to improve students' ability to use the above principles. Students are required to master basic knowledge about elements and compounds in chemistry. The module will also enable students to systematically, comprehensively and deeply understand the basic principles, basic concepts and basic theories of quantitative analytical chemistry, and on this basis to master the methods and principles of determining the content of related components. Through practical classes, students are guided to observe experimental phenomena carefully, and directly gain a perceptual knowledge of chemistry, consolidating and deepening their understanding of the learned theoretical knowledge. The module will allow students to master the basic methods and skills of chemical experiments.

Learning Outcomes

After completing the module the student should be able to:

- 1 Describe the composition of macro and micro materials, and master the general laws of their existence and movement.
- 2 Define the status and role of chemistry in the knowledge systems of various disciplines such as agricultural sciences and life sciences.
- 3 Apply the basic principles of chemical thermodynamics and chemical kinetics in order to perform theoretical analysis and calculation on general chemical problems.
- 4 Describe the basic principles, basic concepts and basic theories of quantitative analytical chemistry.
- 5 Demonstrate the various methods for determining the content of ingredients and explain the principles of the methods.
- 6 Demonstrate the skill of titration operation of classical chemical analysis methods.
- 7 Record and process experimental data, and combine theoretical and practical basic experimental qualities.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Exam	1	2	3	4	5	7	6
Exam	1	2	3	4	5	7	6
Test	1	2	3	4	5	7	6
Practice	1	2	3	4	5	7	6
Practice	1	2	3	4	5	7	6
Report	1	2	3	4	5	7	6
Test	1	2	3	4	5	7	6
Exam	1	2	3	4	5	7	6
Exam	1	2	3	4	5	7	6
Test	1	2	3	4	5	7	6
Report	1	2	3	4	5	7	6
Practice	1	2	3	4	5	7	6
Test	1	2	3	4	5	7	6

Outline Syllabus

The module content includes study of gases, solutions and colloids, chemical reaction rate, thermal effects of chemical reactions, Gibbs free energy and chemical equilibrium, acid-base balance, precipitation and dissolution equilibrium, redox reaction, classification, purpose, role, and method of analytical chemistry, errors and data processing in quantitative analysis, and absorptiometry.

Learning Activities

The module focuses on both classroom teaching, supplemented by some classroom discussions and extracurricular exercises, along with development of practical skills through experimental operation. The role of the teacher is to guide and inspire students to practice and learn independently and to guide and demonstrate the use of typical experimental techniques and instruments.

Notes

The module will enable students to have ability to theoretically analyse and calculate general chemical problems, whilst developing students' scientific thinking ability. The module will lay the necessary chemical foundation for future learning of follow-up courses and new theories and new experimental techniques, and improve students' professional knowledge.

