

ZCHE H2102: Analytical/Inorganic Chemistry

Module Title:			Analytical/Inorganic Chemistry			
Language of Instruction:		n:	English			
Credits:		15				
		0				
NFQ Level:		6				
Modulo Doli	worod In		1 programme(c)			
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Teaching & Learning Strategies:			This module will be taught in two theory classes of one hour duration for 30 weeks and one practical of three hours duration for thirty weeks. Students will visit one industrial site during the year. To consolidate lectures and practicals, students will normally be required to carry out assignments and prepare a weekly practical report analysing their own research and results. Any course-related issue or questions that may arise will be discussed at lectures.			
Module Aim:			The aim of this module is to impart knowledge of basic analytical principles, in areas of spectroscopic, titrimetric, electrochemical and transition metal chemistry and to provide practical training in this subject area with due regard to best practice and safety.			
Learning Ou	itcomes					
On successfu	ul completior	n of th	nis module the learner should be able to:			
LO1	Demonstrate a theoretical knowledge and understanding of analytical chemistry as applied to spectroscopic and titrimetric analysis.					
LO2	Describe the physical and chemical properties of the representative and transition elements.					
LO3	Demonstra	ate the	e fundamentals of ionic solutions and electrochemical cells			
LO4	Demonstra	ate a k	knowledge of basic inorganic chemistry.			
LO5	Demonstra	ate pro	pficiency in the use of laboratory instruments.			
LO6	Apply the a	appro	priate safety procedures and regulations in the laboratory			
Pre-requisite learning						
Module Recommendations This is prior learning (or a practical skill) that is recommended before enrolment in this module.						
No recommendations listed						
<i>Incompatible Modules</i> These are modules which have learning outcomes that are too similar to the learning outcomes of this module.						
No incompatible modules listed						
Co-requisite Modules						
No Co-requisite modules listed						
Requirements This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.						
Successful completion of year 1 or equivalent						



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Module Content & Assessment

Indicative Content

Theory

1. Titrimetric methods: Principles of acid-base, complexometric, redox and precipitation titrations; importance of indicator concentration/selection and stoichiometric calculations. 2. Transition metal chemistry: The first series of transition elements. The metals (Sc - Zn): electronic configurations, chemical properties and uses. 3. Spectroscopic methods: The electromagnetic spectrum. Introduction to atomic absorption spectroscopy, flame photometry, FTIR and UV-Vis methods, including sample treatment, concentration range, industrial applications, optimum conditions, interferences. 4. Inorganic Chemistry: Systematic chemistry of the non-transition elements i.e. physical properties, group chemical reactions. 5. Ionic solutions & Electrochemical cells. Nernst equation

Practical

Two "dry" practicals covering relevant calculations and H&S requirements will be followed by an introduction to the Analytical laboratory. Subsequent practicals will develop skills in the use of analytical equipment and techniques from AAS, FP, FTIR, UV-Vis and various titrimetric analysis.Use of ion-selective electrodes, conductimetric titrations. Preparative Inorganic chemistry and qualitative Inorganic chemistry will also be scheduled. The practicals covered will reinforce and amplify the material covered in the lecture course. A major emphasis will be placed on the interfacing of instruments with updated software, e.g., probe for UV-Vis.

Assessment Breakdown	%
Continuous Assessment	10.00%
Practical	40.00%
End of Module Formal Examination	50.00%

Special Regulation

Students must achieve a minimum grade (35%) in both the practical/CA and final examination.

Continuous Assessment					
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date	
Other	3 continuous assessment exams	1,2,3,4	10.00	n/a	

No Project

Practical					
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date	
Practical/Skills Evaluation	Practical Log Book	5,6	40.00	Sem 1 End	

End of Module Formal Examination					
Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date	
Formal Exam	No Description	1,2,3,4	50.00	End-of-Semester	

SETU Carlow Campus reserves the right to alter the nature and timings of assessment



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Module Workload

Workload: Full Time				
Workload Type	Frequency	Average Weekly Learner Workload		
Lecture	30 Weeks per Stage	2.00		
Laboratory	30 Weeks per Stage	3.00		
Estimated Learner Hours	30 Weeks per Stage	2.00		
	Total Hours	210.00		

Module Delivered In				
Programme Code	Programme	Semester	Delivery	
CW_SASES_B	Bachelor of Science (Honours) in Environmental Science	2	Mandatory	