

<b>Module Title:</b>	Analytical Inorganic Chemistry 1
<b>Language of Instruction:</b>	English
<b>Credits:</b>	10
<b>NFQ Level:</b>	6
<b>Module Delivered In</b>	<a href="#">3 programme(s)</a>
<b>Teaching &amp; Learning Strategies:</b>	This module will be taught in 3 theory classes of one hour duration for 12 weeks and one practical classes of three hour duration for 12 weeks. To consolidate lectures and practicals, students will be required to carry out assignments and prepare weekly practical reports analysing their own research and results. Any course related issues or questions that may arise will be discussed in lectures. Formal examination will take place at the end of the semester.
<b>Module Aim:</b>	The aim of this module is to impart knowledge of the basic analytical principles, in areas of spectroscopic, titrimetric, electrochemical and transition metal chemistry and to provide practical training in this subject are with due regard to best practice.
<b>Learning Outcomes</b>	
<i>On successful completion of this module the learner should be able to:</i>	
LO1	Apply a theoretical knowledge and understanding of analytical chemistry as applied to spectroscopic and titrimetric analysis.
LO2	Engage the fundamentals of ionic solutions and electrochemical cells.
LO3	Exhibit proficiency in the use of analytical laboratory instruments and relevant sample preparation.
LO4	Employ the appropriate safety procedures and regulations in the laboratory.
<b>Pre-requisite learning</b>	
<b>Module Recommendations</b> <i>This is prior learning (or a practical skill) that is recommended before enrolment in this module.</i>	
No recommendations listed	
<b>Incompatible Modules</b> <i>These are modules which have learning outcomes that are too similar to the learning outcomes of this module.</i>	
No incompatible modules listed	
<b>Co-requisite Modules</b>	
No Co-requisite modules listed	
<b>Requirements</b> <i>This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.</i>	
Successful completion of year 1 or equivalent	

## Module Content & Assessment

### Indicative Content

#### Theory

1. Spectroscopic Methods: The electromagnetic spectrum. Introduction to AAS, FES, FTIR and UV-VIS methods, including sample preparation, concentration range, industrial applications, optimum conditions, interferences and method validation. 2. Titrimetric Methods: Principles of acid-base, complexometric, redox and precipitation titrations; importance of indicator selection and concentration, and stoichiometric calculations. 3. Ionic Solutions and Electrochemical Cells: Nernst Equation. 4. Transition Metal Chemistry: The first series of transition elements. The metal (Sc-Zn); electronic configuration, chemical properties and uses. 5. Inorganic Chemistry: Systematic chemistry of the non-transition elements i.e. physical properties, group chemical reactions.

#### Practical

Introductory practicals covering the relevant health and safety of the laboratory and calculations. Subsequent practicals will develop skills in the use of analytical instrumentation (AAS, FES, FTIR, UV-VIS, GC, HPLC, IC), analytical equipment (pH and ion selective electrodes and conductivity meter), and techniques (titrimetric methods, sample preparation, method validation). Preparative inorganic chemistry and qualitative inorganic chemistry is also scheduled. The practicals covered will reinforce and amplify the materials covered in the lecture course. A major emphasis will be placed on the interfacing of new and updated instrument software and industrial techniques.

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

### Special Regulation

Student must receive a minimum grade (35%) in both the CA and practical, and final examination.

### Continuous Assessment

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Other	Continuous Assessment Exam	1,2	10.00	n/a

No Project

### Practical

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Practical/Skills Evaluation	Practical Report Book	3,4	40.00	Sem 1 End

### End of Module Formal Examination

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Formal Exam	n/a	1,2	50.00	End-of-Semester

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

**Module Workload**

<b>Workload: Full Time</b>		
<i>Workload Type</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecture	12 Weeks per Stage	3.00
Laboratory	12 Weeks per Stage	3.00
Independent Learning	15 Weeks per Stage	11.87
Total Hours		250.00

**Module Delivered In**

Programme Code	Programme	Semester	Delivery
CW_SAPHA_B	<a href="#">Bachelor of Science (Honours) in Pharmaceutics and Drug Formulation</a>	3	Mandatory
CW_SAASC_D	<a href="#">Bachelor of Science in Analytical Science</a>	3	Mandatory
CW_SASCI_C	<a href="#">Higher Certificate in Science in Applied Biology or Applied Chemistry</a>	3	Group Elective 2