

<b>Module Title:</b>	Analytical/Inorganic Chemistry
<b>Language of Instruction:</b>	English
<b>Credits:</b>	15
<b>NFQ Level:</b>	6
<b>Module Delivered In</b>	<a href="#">1 programme(s)</a>
<b>Teaching &amp; Learning Strategies:</b>	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.
<b>Module Aim:</b>	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.
<b>Learning Outcomes</b>	
<i>On successful completion of this module the learner should be able to:</i>	
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	Demonstrate the fundamentals of ionic solutions and electrochemical cells
LO4	Demonstrate a knowledge of basic inorganic chemistry.
LO5	Demonstrate proficiency in the use of laboratory instruments.
LO6	Apply 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. 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

### 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	<a href="#">Bachelor of Science (Honours) in Environmental Science</a>	2	Mandatory