Module Title Physical And Inorganic Chemistry	ReferenceAS2002SCQF Level SCQF 8SCQF Points15ECTS Points7.5
<b>Keywords</b> Thermodynamics, Kinetics, Periodic and Group Trends.	Created May 2002 Approved July 2002 Amended September 2011 Version No. 3

# This Version is No Longer Current

The latest version of this module is available here

#### **Prerequisites for Module**

AS1801 Chemistry for Life Sciences or equivalent.

### **Corequisite Modules**

None.

**Precluded Modules** 

None.

#### Aims of Module

To introduce the student to the First Law of Thermodynamics, reaction kinetics of simple systems and the chemical properties of s- and p- block elements.

#### **Learning Outcomes for Module**

On completion of this module, students are expected to be able

Periodic and Group trends: periodic trends, group valencies, trends in chemical behaviour, atypical behaviour of the first member of a group, reducing and oxidising states, inert pair effect, catenation, detailed chemistry of Groups 3, 4 and 5, applications.

## **Indicative Student Workload**

Contact Hours	Full Time
Lectures	24
Tutorials	12
Directed Study	
Directed Study	44
Private Study	
Private Study	70

# **Mode of Delivery**

This course is a combination of self study material and lectures supplemented with tutorial sessions and case studies.

- 1.Explain and apply the principles of the first law of thermodynamics.
- 2.Calculate rate constants, reaction orders and activation energies for simple chemical reactions.
- 3.Explain the chemical properties of selected s- and pblock elements and their applications.

### **Indicative Module Content**

Thermodynamics: First Law, internal energy and work, state functions, enthalpy, relationship between ?H and ?U, standard state, enthalpies of combustion and reaction, Hess's Law, Born-Haber cycle, bond enthalpies, heat capacity. Chemical Kinetics: measurement of reaction rate, effect of concentration on rate, rate constant and order, rate equations for zero, first and second order reactions, experimental determination of order and relation to mechanism. Effect of temperature on reaction rate, simple collision theory, Arrhenius equation.

## Assessment Plan

	Learning Outcomes Assessed
Component 1	1,3
Component 2	2

Component 2: An open-book problem solving exercise.

Component 1: Closed book exam.

## **Indicative Bibliography**

- 1.Atkins, P.W.and de Paula, J., 2010. *Physical Chemistry*, 9th ed., Oxford University Press.
- 2.Housecroft, C.E. 2012. *Inorganic Chemistry* 4th ed., Pearson.
- 3.COX, P.A., 2004, *Inorganic Chemistry*. 2nd ed., Taylor & Francis
- 4.Atkins, P.W.and de Paula, J., 2013. *Elements of Physical Chemistry*, 6th ed., Oxford University Press.