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# COURSE MODULE INFORMATION

## CH101: Chemistry

### Semester 1 and Semester 2 | Credits: 15

This Module lays a broad foundation in chemistry for students who have an option of continuing to study chemistry in subsequent years. Some of these students will study chemistry to degree level and pursue careers as chemists. The Module assumes no prior knowledge of chemistry, although a significant minority of students will have a Level 5 (NFQ Level 5) qualification in chemistry. The aim is to provide the learner with the knowledge, skills and competences associated with molecular and physico-chemical approaches to the study of matter and of chemical change. The Module is designed to develop an understanding of how chemicals function in “real world” applications and how chemistry integrates with human, social and environmental issues. Students will also develop the knowledge, skills and competences appropriate for effective and safe work in a chemistry laboratory.

(Language of instruction: English)

### Learning Outcomes

1. predict chemical formulas of compounds using valence considerations and the knowledge of simple and complex cations and anions
2. perform mass- and mole-type calculations, to include isotopes, chemical equations and chemical analyses
3. use models of structure at the atomic/molecular level, including intermolecular forces, to explain the physical properties of matter and the properties of solutions

- draw representations of the bonding and geometry of simple inorganic and organic molecules and ions, to include Lewis structures, resonance structures, formal charges, ionic character, and the use of Valence Shell Electron Pair Repulsion (VSEPR) theory
- show how acid-base, redox and precipitation reactions in aqueous solutions are used for qualitative and quantitative analyses
- solve basic quantitative problems involving chemical equilibrium and chemical kinetics, to include thermochemistry, entropy, Gibbs free energy, the direction of spontaneous change, and the effect of temperature on the rate of reactions
- name inorganic and organic compounds according to IUPAC nomenclature
- demonstrate familiarity with the chemistry of representative elements and their compounds, and with the structure and reactivity of the main organic functional groups
- rationalize the properties of the elements and their compounds using basic quantum-mechanical models (including electron configuration, atomic spectra and periodic trends), and using the concepts of oxidation state and charge density
- draw mechanisms for a range of simple organic reactions
- relate the chemical properties of selected elements and compounds to their uses, human and social relevance, and environmental impact
- analyze salts for the presence of common cations and anions, and simple organic substances for the presence of common functional groups
- use appropriate laboratory techniques and equipment to synthesize, separate and purify chemical compounds
- use titrimetry and physico-chemical techniques for quantitative analysis and to determine physico-chemical properties
- implement safe work practices in a chemistry laboratory, to include awareness of common hazards and appropriate safety precautions
- report to a scientifically acceptable standard on laboratory work

## Assessments

i This module's usual assessment procedures, outlined below, may be affected by COVID-19 countermeasures. Current students should check Blackboard for up-to-date assessment information.

- Written Assessment (60%)

- Continuous Assessment (40%)

## Module Director

- LUCA RONCONI: [Research Profile](#) | [Email](#)

## Lecturers / Tutors

- JUDY BUCKLEY: [Research Profile](#)
- BERNADETTE CONROY: [Research Profile](#)
- KAREN KELLY: [Research Profile](#)
- MARIAN VIGNOLES: [Research Profile](#)
- LUCA RONCONI: [Research Profile](#)
- PAUL MURPHY: [Research Profile](#)
- DAVID CHEUNG: [Research Profile](#)

## Reading List

1. "Chemistry & Chemical Reactivity" by J.C. Kotz, P.M. Treichel, J.R. Townsend, D.A. Treichel  
ISBN: 1337399078.  
Publisher: Cengage Learning

The above information outlines module CH101: "Chemistry" and is valid from 2019 onwards.

Note: Module offerings and details may be subject to change.

## ABOUT NUI GALWAY

Founded in 1845, we've been inspiring students for 175 years. NUI Galway has earned international recognition as a research-led university with a commitment to top quality teaching.

## CONTACT

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