BIC3033-B module descriptor	
Module Title	Introduction to Chemistry and Biology
Credit Level	20 credits (RQF Level 3)
Session	2026/7 academic year
BDA occurrence	Academic Year available at University of Bradford
BDA occurrence	Non Standard Year available at University of Bradford

Transparency notice

This specification for module code BIC3033-B has been generated automatically in advance of the academic year 2026/7. Every effort has been made to ensure that the information is accurate at the time of publication, but changes permitted by our Student Contract Terms and Conditions could be made in the interval between publishing and commencement of teaching; where changes impact the terms and conditions of an applicant's or student's offer, these are communicated to them as soon as possible.

BIC3033-B module aims

This module provides students with an introduction to the areas of Chemistry and Cell Biology that underpin undergraduate study across a range of Life Sciences courses.

As well as developing students' understanding of key concepts and principles relating to the structure, properties and behaviour of atoms and the structure and function of living cells (including the basic principles of metabolism), the module aims to develop their awareness and understanding of safe laboratory practice.

BIC3033-B module learning outcomes	
No.	**Students completing the module will be able to:**
01	Describe the basis of atomic and molecular structure and chemical bonding and explain the differences in properties between ions and molecules.
02	Use the mole concept to balance chemical equations
03	Demonstrate the basic principles of chemical energy.
04	Describe the principles of redox reactions.
05	Explain cell structure and describe the significance of cell division, replication, transcription and translation.
06	Describe the properties, formula, structure and role of key biological molecules and enzymes.
07	Describe the main metabolic pathways including carbohydrate metabolism.
08	Demonstrate an awareness of safe laboratory practice.

* The periodic table and elements, compounds and mixtures

* Formulae, equations and moles: Full and ionic equations, reacting masses calculations including yield. Empirical formulae. The mole concept. Relative atomic/molar masses. Avogadro number of formula units in a mole. The molar gas volume. The concentration of solutions, leading to acid/base titrimetry.

* Atomic structure: Sub-atomic particles. Relative masses, isotopy, use of mass spectrometer to determine isotopes. Electrons in shells, sub-shells and orbitals. Ionisation energies.

* Introduction to redox: Oxidation number, redox reactions, oxidising and reducing agents. Ionic half equations and full equations for redox processes. Titrimetry involving the use of potassium manganite (VII) and iodine/thiosulphate.

* Bonding, structure, and the properties of matter (How bonding and structure are related to the properties of substances). The three states of matter and sizes of particles and their properties and uses of nanoparticles.

*Chemical changes (The process of electrolysis and electrolysis of molten ionic compounds) and chemical analysis (Purity, formulations and chromatography).

* Bonding: Ionic, covalent, dative covalent, metallic bonds. Electronegativity and the relationship of structure and bonding to properties of materials.

* Biological molecules: Molecule properties, formula and functions of water, carbohydrates, lipids, proteins, nucleic acids, storage compounds: starch, glycogen and triglycerides.

* Cellular functions: Prokaryotic (structure and function), Eukaryotic (including organelles nucleus, mitochondria, cell wall, lysosomes, endoplasmic reticulum, Golgi apparatus, ribosome, vacuole, flagella), membrane structure and function, Viruses (structure and exceptions to the cell theory).

* Chromosome structure: Concept of a gene, protein synthesis and DNA replication.

* Cell division: Mitosis, Meiosis and crossing over.

* Enzymes: Structure and properties, effects of temperature, pH and inhibitors.

* Metabolic pathways: Catabolism and anabolism, interrelationship of metabolic pathways, inspirational pathway, aerobic and anaerobic respiration.

For more information, visit the VLE (**Canvas**) page, go to our **Reading Lists webpage for this module** or search **https://bradford.rl.talis.com** for this module.

BIC3033-B module notional learning hours

- 110 hours Directed Study
- 70 hours Lectures
- 20 hours Laboratories

The overall expected hours may include contact time, scheduled learning activity, directed and independent study and any minimum expectations for placement learning. Most learning at the University of Bradford has some online content and sessions which are delivered fully by virtual means are labelled as "online".

BIC3033-B module learning, teaching and assessment

Groups are small and classes are student-centred, task-based and interactive.

The classroom approach is explicitly designed to help international students acquire new knowledge and skills, to build their confidence and enable them to become more independent learners. By doing this consistently and across all modules, the programme provides them with a strong foundation for further study in their chosen subject area.

The approach is inclusive and recognises that students come from different backgrounds with a range of previous learning experiences and associated expectations, beliefs and behaviours. Teaching and learning methods are clearly explained so students understand why (where appropriate) they need to engage in new ways of learning and why those they have used or relied on up to this point may be less suited to supporting their ongoing development and their chances of success in UK Higher Education.

Formative work is an integral part of the approach. In class, students are set tasks that require them to apply their knowledge and skills, to think critically and to solve problems. The level of challenge is gradually increased as the students grow in confidence and Tutors help them to see that experimentation, trial and error are central to the learning process, providing constructive feedback on both what has been achieved and how.

Students are also expected to engage in independent study, to reflect on their own performance and to discuss this with their module tutor or personal academic tutor, who will provide support and advice and, when necessary, draw the attention of the Academic Management Team to a struggling student using the Students of concern process.

The assessment strategy supports the development of foundational scientific knowledge and laboratory skills necessary for progression to undergraduate life science programmes.

Laboratory reports (40%) assess Learning Outcomes 3-8 and require students to demonstrate safe laboratory practice, scientific observation, data recording and interpretation.

A Chemistry examination (30%) assesses Learning Outcomes 1-4 through multiple-choice and short-answer questions.

A Biology examination (30%) assesses Learning Outcomes 5-7 and focuses on cell biology, metabolism and biological systems.

Students must demonstrate both theoretical understanding and practical competence.

Formative opportunities include laboratory activities, practice examination questions, peer discussion exercises and online quizzes.

Success is demonstrated through accurate scientific reasoning, correct application of key concepts and appropriate communication of scientific findings.

To pass the module, students must achieve the University pass mark overall. Students who do not pass the first time will be given an opportunity to complete equivalent assessments that address the failed learning outcomes.

BIC3033-B mode of assessment			
Type	**Mode**	**Assessment description**	**Weight**
Summative	Laboratory Report	Laboratory Reports on a practical session: Chemistry (LO3, LO4 LO8) Biology (LO5, LO6, LO8). 1000 words	40%
Summative	Examination - Closed Book	Unseen exam consisting of multiple choice and short answer questions. Testing Chemistry part of the course	30%
Summative	Examination - Closed Book	Unseen exam consisting of multiple choice and short answer questions. Testing Biology Part of the course .	30%

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