



Undergraduate Pathway: Optometry, Medical, and Life Sciences

[BOptom \(Hons\) Optometry](#)

[BSc \(Hons\) Animal Behaviour](#)

[BSc \(Hons\) Biomedical Science](#)

[BSc \(Hons\) Crime & Investigative Studies](#)

[BSc \(Hons\) Forensic Science](#)

[BSc \(Hons\) Marine Biology with Biodiversity and Conservation](#)

[BSc \(Hons\) Medical Science \(Camb\)](#)

[BSc \(Hons\) Medical Science \(Chelm\)](#)

[BSc \(Hons\) Ophthalmic Dispensing](#)

[BSc \(Hons\) Pharmaceutical Science \(Camb\)](#)

[BSc \(Hons\) Pharmaceutical Science \(Chelm\)](#)

[BSc \(Hons\) Public Health](#)

[BSc \(Hons\) Zoology](#)

Element Overview:

Interactive Learning Skills and Communication (ILSC)

This Element has been designed to help students develop their academic literacy, and research and communication skills in preparation for undergraduate study. The areas of reading, writing, speaking, and listening will be covered. ILSC also helps students understand the institutional culture, practices, norms and expectations of the UK higher education.

A subsidiary aim of this Element is to ensure that students develop transferable skills of effective and professional communication to support ongoing study, as well as providing a basis to foster career and life-building skills.

Information and Communication Technology (ICT)

No previous technical experience is required for this Element, which provides students with an introduction to practical ICT skills. This foundation will be needed for academic success across many areas of higher education. The students will use industry standard office productivity software and techniques to produce presentations, written assignments, and charts and tables in spreadsheets.

Alongside practical skills, fundamental topics surrounding technology use will be discussed, together with societal and ethical perspectives. The Element will enable students to discuss the main challenges facing society and consider the implications of their technology use. By the end of the Element, students should have sufficient mastery of the Microsoft Office productivity suite to allow them to plan and produce presentations, use functions and write formula to display, format and analyse quantitative data and produce written assignments to a standard appropriate to higher education.

Critical Thinking

This Element aims to enable candidates to participate in and practice independent learning tasks for deeper thought and investigation as needed for Higher Academic pursuits. This Element is designed



to teach, reinforce, and practice independent learning and critical thinking, as opposed to rote memorisation for success in University and professional life. An open-class forum of discussion is used to encourage critical thinking skills within academic and professional-facing contexts.

This Element enables candidates to invest in strategies that will deepen understanding and interpretation of processes, motives, argument, rationale, credibility, and possibilities which will then be applicable to a range of studies. Students will undertake research, based on an issue related to their degree programme, to review the main points of examining an argument in depth. They will learn to create a personal response that analyses the content of the issue under study.

Maths for Scientists

Foundation Maths for Science is a course that ensures students on the extended programmes for degrees in the areas of Life Sciences, Biomedical and Forensic Sciences, and Vision and Hearing Sciences have the necessary basic mathematical skills required for entry to level 4. By the end of the course, students will be able to carry out basic mathematical manipulations and understand the relevant key concepts required in order to progress to their chosen degree course. Each mathematical concept is introduced by a lecture, in which examples of how to use and apply the concept are demonstrated. Students practise problems in a tutorial for each topic, using worksheets given out in advance of the sessions. The worksheets include problems applied to the various degree pathways to which the students will progress, to indicate the importance and applicability of mathematics to their future degrees. The subjects covered are a range of arithmetic skills, algebra, areas and volumes, trigonometry and basic statistics.

Cellular Biology

In this Element students will study the structure and function of cellular organelles, membranes and transport systems, in both prokaryotes and eukaryotes. Eukaryotic cell diversity will focus on mammalian blood composition, and the structure and function. In addition, cell metabolism - the biochemical processes undertaken in living organisms - is a key focus of this Element. Cellular respiration of glucose and the role of mitochondria will be discussed as well as the fundamental principle of biology in the ability to renew (cells) and reproduce, both sexually and asexually; the mechanisms of cell division via mitosis and meiosis.

The composition of cells, structure and function of the four groups of macromolecules - proteins, carbohydrates, nucleic acids and lipids - will be studied. A specific focus will be the mechanism of action of enzymes and factors such as pH and temperature that affect their function. This Element will provide students with an introduction to key processes operating within living organisms, including energy provision, transport, control and co-ordination alongside key ecological concepts.

Biology- Physiology

This element will study the science of body functions and their relation to the structure, or anatomy, or the organism (physiology). In this element, main organ and regulatory systems that work to enable the body to function and respond to change, whilst maintaining a constant internal environment, will be studied. Although this element will focus mainly on the human body as an example of a frequently studied organism, reference to other organisms will be made to illustrate particular principles or to contrast different systems and mechanisms.

The structure and function of the major organ systems, including the cardiovascular, respiratory, gastrointestinal, musculoskeletal, nervous, endocrine, reproductive, and immune systems will be studied. To function, the human body is required to maintain its internal environment within narrow



limits. The homeostatic mechanisms needed to maintain homeostasis will be investigated and how they respond to differing conditions examined, with particular emphasis on thermoregulation and osmoregulation. Examples of negative feedback will be used throughout the course to illustrate the importance of how homeostasis is maintained. Classification and the basic principles of genetic inheritance will be introduced and considered in the context of Darwin's theory of natural selection.

Chemistry

This element provides an elementary introduction to chemical science. No prior knowledge of chemistry is assumed. The study of materials and the undergoing chemical changes will be discussed. These principles will then be developed further by exploring the periodic table, chemical equations, calculating concentrations, quantitative chemical analysis such as colorimetry, chemical equilibria and organic chemistry.

The practical element of the course will allow students to gain practice in some basic laboratory techniques based on the concepts covered in the lectures. In addition, tutorials will be held for students to ask questions and to practice exam-style questions from the relevant lectures. Laboratory experience and exposure will also equip students with required transferable skills for their University study. The focus will be on good laboratory practice and sustainable approaches to chemistry.

Physics for Life Scientists

This element introduces the principles and laws of physics which underpin all life sciences. No prior knowledge of physics is assumed, and the focus will be on those aspects which are specific to the requirements of students for Level 4 and beyond. The element will be taught with a mixture of lectures, workshops, tutorials and practicals.

The element will encompass aspects such as how organisms move in relation to their environment; how organisms perceive their environment in terms of light and sound; how the physics of fluids and gasses affect the anatomy and physiology of organisms; how electricity is used to allow communication, how radioactivity impacts on organisms, and the applications of physics in modern medicine. The practical aspect of this element will allow the students to develop an understanding of how the theory they are taught in lectures is applied in practical situations.