Subject specific learning outcomes

Specific skills and knowledge appropriate to the degree title

In addition to the core learning outcomes specified in the Degree Accreditation Handbook, specific outcomes have been developed by Learned Societies across the key areas of the biosciences.

Degrees using 'Biochemistry' in their title

The **Biochemical Society** suggests that the graduates of a biochemistry degree programme should be able to:

- demonstrate an understanding of the chemistry, structure and function of biological molecules
- explain biological mechanisms, such as the processes and control of bioenergetics and metabolism, as chemical reactions
- explain the biochemical processes that underlie the relationship between genotype and phenotype
- demonstrate an understanding of the structure and function of both prokaryotic and eukaryotic cells (including the molecular basis and role of subcellular compartmentalization)
- apply laboratory-orientated numerical calculations (e.g. inter-conversion of masses, moles, and molarity, preparation of solutions and accurate dilutions)
- be capable in data visualization and analysis, including the application of data transformations (e.g. logarithmic, exponential)
- demonstrate an understanding of the principles, and have practical experience of, a wide range of biochemical techniques (e.g. basic molecular biology, cell biology and microbiology methods, spectrophotometry, the use of standards for quantification, enzyme kinetics; macromolecular purification, chromatography and electrophoresis)
- analyse biochemical data, (e.g. in enzyme kinetics, molecular structure analysis and biological databases)

Please also see 'Appendix 1 RSB Additional Subject Specific Guidance – Biochemistry' which provides advice on chemistry within Biochemistry degrees, from the **Biochemical Society**.

Degrees using 'Ecology' in their title

The **British Ecological Society** suggests that the graduates of an ecology degree programme should be able to:

- demonstrate practical fieldwork skills (e.g. ecological survey techniques, species identification and ecological impact assessments)
- demonstrate an understanding of key ecological interactions and processes: the distribution and abundance of organisms, the interactions among organisms, the interaction between organisms and their environment, and the structure and function of ecosystems
- explain scales and patterns in ecology and biodiversity (e.g. individual to biosphere, landscape ecology, geographic and global ecology)
- appreciate the relationships between ecology and society (e.g. science into policy, conservation ecology, biodiversity conservation, natural resource capital, ecosystem services)

Degrees using 'Microbiology' in their title

The **Society for Applied Microbiology** suggests that the graduates of a microbiology degree programme should be able to:

- analyse and manipulate microorganisms under appropriate containment conditions
- apply aseptic technique for isolation, culture, enumeration and safe disposal of microorganisms
- characterise and identify microorganisms using a wide variety of systematic techniques (including those based on physiology, biochemistry, chemosystematics and molecular biology)
- analyse the interaction of microbes with their environment, including other microflora
- explain the application of microbiology, and its contribution to solving global challenges facing humanity (including infection control, food security, energy supply and climate change)

Degrees using 'Pharmacology' in their title:

The **British Pharmacological Society** suggests that the graduates of a pharmacology degree programme should be able to:

- construct and analyse drug concentration/dose-response relationships using living tissues or model systems with knowledge of the pharmacologist's role in developing in vitro and in vivo models in which drug action can be tested
- evaluate the action of drugs in whole organisms, living tissues, and/or model systems using a variety of pharmacological techniques (e.g. bioassays, receptor binding, receptor cloning, recombinant proteins for therapy, animal models of disease, genetic manipulation of cells and animals and their uses)
- apply principles of pharmacokinetics using living tissues, model systems or simulations (e.g. pharmacokinetic modelling software) and demonstrate numeracy in pharmacological calculations (e.g. drug concentration, loading dose, therapeutic index)
- explain how advances in pharmacology (e.g. small molecular inhibitors, antisense therapy, biopharmaceuticals, pharmacogenomics, novel drug delivery systems) can contribute to improving human and animal health including the development of personalised therapies

Degrees using 'Physiology' in their title:

The **Physiological Society** suggests that the graduates of a physiology degree programme should possess the following subject specific skills and knowledge

- describe and explain the relationship between the molecular, cellular and tissue structure of each body system and relate this to their different functions and physiological roles in health and disease
- explain the concept and importance of maintaining physiological homeostasis at the cellular, system and organismal level, and the consequences of homeostatic imbalance in disease
- describe how cells communicate with each other, the concepts of positive and negative feedback between cells, and the importance of these processes in the maintenance of physiological homeostasis
- explain the principles of collecting physiological data, and apply practical skills in either human or animal models both in vivo (e.g. ECG, spirometry, nerve conduction) and ex vivo

(e.g. isolated tissue experiments, cell culture, haemolysis assays, molecular biology techniques)

- analyse physiological data (e.g. electrophysiological signals, fluorescence images) using appropriate data handling and statistical methods, and demonstrate an awareness of the ethical and legal issues that relate to collecting physiological data from human and animal subjects