

ESTABLISHED 1931



INTERNATIONAL FOUNDATION PROGRAMME BIOMEDICAL SCIENCE

COURSE OVERVIEW

The Biomedical Science International Foundation Programme is a one-year intensive course, designed as an alternative to A Levels, which prepares students for undergraduate study for a range of science courses at university.

Students can progress to a variety of university courses such as medicine, biomedical sciences and biological sciences, chemistry, biochemistry, nutrition, sports science, and pharmacy.

Who is it recommended for?

International students looking for a one year programme that enables progression to study medicine or a range of science courses at a university in the UK or overseas.

Course Structure

The programme has three components: Biology, Chemistry, Essential Mathematics, Academic Skills & Research, and Personal Development. The subject weightings are shown below.

	Biology	Chemistry	Essential Mathematics	AS&R PDev
International Foundation Programme - Biomedical Science Pathway	35%	35%	15%	15%

Assessment

The programme is assessed by examinations held in January and June each year. There are two exams sat in Biology, two in Chemistry, and two in Advanced Mathematics.

	Biology	Chemistry	Essential Maths
January Exams	Biology 1	Chemistry 1	Essential Mathematics 1
June Exams	Biology 2	Chemistry 2	Essential Mathematics 2

The percentages from each subject are added together to produce an overall grade:

Overall	>90%	85-	80-	75-	73-	70-	65-	60-	55-	40-
Score		90%	84%	79%	74%	72%	69%	64%	59%	49%
Equivalent A Level Grades	A*A*A*	A*A*A	A*AA	AAA	AAB	ABB	BBB	BBC	BCC	ССС



COURSE COMPONENTS

On average, students have approximately 16 hours of lessons per week, and are expected to supplement this with at least 10 hours of independent study.

BIOLOGY DESCRIPTORS

The Foundations of Biology

This unit introduces the biochemical basis of living organisms, their cellular nature and how cells arise from other cells. It also considers the organs and mechanisms involved in human gas exchange, digestion and blood circulation. Compulsory practicals enable students to appreciate scientific methods and develop competence in handling apparatus.

- 1. Cell Structure
- 2. Biological Molecules
- 3. Nucleotides and Nucleic Acids
- 4. Enzymes
- 5. Biological Membranes
- 6. Communicable Diseases, Disease Prevention & The Immune System
- 7. Exchange Surfaces
- 8. Digestion & Absorption
- 9. Transport in Animals
- 10. Respiration

Nature and Nurture

This unit introduces more complex biochemical an physiological processes. More challenging topics are covered, including homeostasis and genetics. The mechanism and uses of gene manipulation and biotechnology are studied.

- 1. Communication and Homeostasis
- 2. Excretion

10

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- 3. Neuronal Communication
- 4. Hormonal Communication
- 5. Animal Responses
- 6. Cell Division and Organisation
- 7. Meiosis
- 8. Classification and Evolution
- 9. Patterns of Inheritance
- 10. Cellular Control
- 11. Manipulating Genomes
- 12. Biotechnology and Cloning





CHEMISTRY DESCRIPTORS

The Foundations of Chemistry

Students will learn the key thinking that underpins all chemistry. They will develop their quantitative skills and use their knowledge to relate macroscopic properties to the structure and bonding. They will also look at organic molecules and start to analyse the mechanism by which reactions occur. Relevant practical skills will be developed.

- 1. Development of Practical Skills
- 2. Atoms, lons and Compounds
- 3. Amount of Substance
- 4. Acids & Redox
- 5. Electrons & Bonding
- 6. Shapes of Molecules & Intermolecular Forces
- 7. Periodicity
- 8. Reactivity Trends (Group 2 & Group 7)

- 9. Enthalpy Changes
- 10. Rates of Reaction & Equilibrium
- 11. Basic Concepts Organic Chemistry
- 12. Alkanes
- 13. Alkenes
- 14. Alcohols
- 15. Haloalkanes
- 16. Organic Synthesis
- 17. Spectroscopy (Infrared and Mass Spectroscopy)



The Applications of Chemistry

Students will learn more about the ways in which we can control and understand reactions, both qualitatively and quantitatively. The organic work is developed and introduces more mechanisms and ideas that have a huge impact on biochemistry and drug synthesis. Relevant practical skills will be developed.

- 18. Rates of Reaction
- 19. Equilibrium
- 20. Acids, Bases & pH
- 21. Buffers & Neutralisation
- 22. Enthalpy & Entropy
- 23. Redox & Electrode Potentials
- 24. Aromatic Chemistry
- 25. Carbonyls & Carboxylic Acids
- 26. Nitrogen Compounds
- 27. Spectroscopy (13C and 1H NMR)





COURSE COMPONENTS

MATHEMATICAL DESCRIPTORS

Essential Mathematics A

More than ever before in human history, we are discovering new chemicals. Future Scientists need to be able to analysed and manipulate data. Essential Mathematics A equips learners with the core skills required to embark on further study of this dynamic field.

- 1. Percentages, Ratios, Standard Form, Significant figures, surds, indices
- 2. Expanding algebraic brackets, factorising algebraic expressions
- 3. Linear and guadratic equations and Inegualities
- 4. Simultaneous equations
- 5. Exponential & Logarithmic Functions/Equations
- 6. Circles, Area of 2D shapes, Volume of 3D shapes, Pythagoras' Theorem
- 7. Equations of straight lines and curves, Parallel and perpendicular lines



Essential Mathematics B

Building on prior study, in Essential Mathematics B students will expand their knowledge and skills gained and apply them to more complex issues. This module demands an analytical and synthetic approach that allows learners to develop mathematical knowledge, skills, imagination and experience to the highest levels in readiness for their future studies and career.

- 12. Sine, Cosine and Tangent ratios
- 13. Arithmetic and Geometric series
- 14. Probability, including mutually exclusive and independent events, Tree diagrams
- 15. Data analysis, including finding Averages (Mean, Media, Mode) and Range
- plots
- 17. Differentiating polynomials, identifying increasing/decreasing functions and stationarypoints

English Language Tuition

The International Foundation Programme includes English Language tuition to prepare students for the IELTS examinations. This ensures that all IFP students meet the English Language entry requirements of their chosen university.

f(x) = g(x) $3 + \ln(x+2) = 4 + \ln(x-1)$ $\ln(x+2) - \ln(x-1) = 1$

16. Venn diagrams, Stem & Leaf diagrams, (Cumulative) frequency tables, Histograms, Box



PROGRESSION ROUTES

Institution	Qualification	Academic Entry Requirements	IELTS Requirement
Kings University (UK)	Biomedical Science	70% Overall Score.	IELTS 6.5 overall with 6.0 in each subtest
Royal Holloway (UK)	Biochemistry	70% overall with 70% in all Biology and Chemistry modules	IELTS 6.5 overall with no subscore below 5.5
Westminster University (UK)	Pharmacology and Physiology	65% Overall Score	IELTS 6.5 overall with no subscore below 5.5
University of York UK	Chemistry with a year abroad	68% overall with 68% in Chemistry and a second science or maths	IELTS 6.5 overall with 6.0 in each subtest

Alternative Progression Routes

In addition, this programme also offers progression to a wide range of university courses including:

- Biomedicine •
- Biochemistry •
- Biological Sciences •
- Pharmacy •
- Sports & Exercise Science •
- Nutrition •
- Optometry •
- Chemistry •
- Chemistry with Cosmetic Science and year in industry Molecular Biology & Environmental Change •
- •
- Zoology •
- Medical Physiology and Therapeutics
 Geosciences and Sustainable Energy



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