

Foundation Diploma in Food Science and Nutrition

Module Outlines

Fundamentals of Mathematics

Fundamentals of Mathematics is developed in view of how numerous applications from many fields of technology often include or indicate where and how mathematical techniques can be used. The module aims to provide students with strong fundamentals in algebra, functions, geometry and trigonometry for further studies with integrated applications in mathematics. Group work will be introduced as a method of transforming students from passive to active learners through application questions where students will be encouraged to discuss with their peers and instructor.

Fundamentals of Chemistry

Fundamentals of Chemistry provides a general overview of the subject area and is designed for students beginning a formal study of chemistry. The module presents important background information on several related topics in addition to the basic scientific concepts of chemistry. This module associates with interesting and simple approach of central science and provides insights into a variety of different phenomena and serves as a basis for understanding on the physical universe we live in. This module presents fundamental concepts intended to better equip students to be well-prepared for the advanced topics of chemistry – physical and organic chemistry for diploma level. Upon completion of the module, students are more aware of the occupational opportunities in science, engineering and technology and are capable of evaluating the academic requirements for different disciplines and ready for future preparation.

Biological Science

Biological Science aims to provide students with the conceptual framework, factual knowledge, and analytical skills necessary to deal critically with the rapidly changing science of biology. It is divided into three general areas: cellular biochemistry, metabolic and signal transduction pathways, and genetics and genomics. It starts with a general introduction on the scope of life, followed by extensive discussions of biomolecules, cell structure and processes, and their roles in more complex biological functions and organisation. Genetics, cell biology and molecular biology which are revolutionising medicine and agriculture will be introduced. The accompanying extensive laboratory sessions will introduce students to the new tools of modern biology and the process of scientific investigations. The objective is to prepare students with a strong foundation in biological concepts and techniques for further studies in the life sciences.

Statistics and Applied Mathematics

Statistics and Applied Mathematics aims to develop further students' understanding of mathematics and mathematical processes and develop abilities to comment and appraise datasets. It also seeks to develop students' ability to think clearly, work carefully and formulate mathematical induction and hypothesis testing approaches to solve problems.

Physical Chemistry

Physical Chemistry focuses on the understanding of concepts central to physical chemistry including the periodic table, gasses, the mole, chemical bonding, acid-base concepts, energy and nuclear chemistry. This module is designed to build a scientific literacy which will permit a greater understanding of industrial processes, environmental concerns, household products and how everyday life depends on chemical phenomena. Students will work on quantitative questions related to stoichiometry solutions, gases and acid-base reactions. This module not only provides students with the opportunity to develop, record and maintain evidence of their written and graphic representation through laboratory reports, it also helps to build the knowledge and skills that are necessary for challenges in the 21st century.

Organic Chemistry

Organic Chemistry provides students with basic principles of organic chemistry and an understanding of the chemical environment. The main emphasis is on the structural approach to organic chemistry, and this equips students with basic understanding of the most common and most important synthetic reactions, which include carbon-carbon bond formation, functional groups creation and manipulation. With the role that organic molecules play in the natural and synthetic world, this allows students to apply methods of scientific inquiry and develop problem solving and critical thinking skills that relate to everyday experiences. The module is designed to develop complementary practical laboratory skills that are related to the science of chemistry and the module also presents a comprehensive overview of organic chemistry as well as biological chemistry to provide students with a solid foundation appropriate to underpin further studies in biochemistry, molecular biology, pharmacology, and related subjects.

Food and Nutrition

This module is designed for basic understanding of food science and nutrition – a study of physical, chemical and biological properties of food. Food science or more specifically the food chemistry is largely about the chemical changes in food. It concerns with the chemical reactivities, properties and food compositions which are closely related to the food quality and safety. The focus includes the study of an overview about the food constituents and how the associated chemical and biochemical reactions can affect the properties. This module will help students to further appreciate the knowledge on how to improve the food formulation/processing and storage stability in other related modules. The module presents a comprehensive overview of food chemistry and nutrition to provide students with a solid foundation appropriate to underpin further studies in biochemistry, molecular biology, pharmacology and related subjects.

Food Microbiology

This module integrates the core fundamentals of food microbiology with the study of infectious diseases. Students will explore the basics of microbiology, focusing on microorganisms' roles in biotechnology, ecosystems, and their interactions with food, including spoilage, preservation, and foodborne diseases. It also covers the chain of infection, immunity, vaccination, disease prevention, and surveillance, with a focus on microorganisms' natural habitats, infection routes, and prevention strategies at various levels. Practical sessions will provide hands-on experience with laboratory techniques for disease diagnosis, such as culture-based, molecular, and immunological methods, culminating in an infectious disease case study to apply theoretical knowledge practically.