

Module Title:	Nutritional Biochemistry, Pharmacology and Dietetics
Language of Instruction:	English
Credits:	10
NFQ Level:	6
Module Delivered In	No Programmes
Teaching & Learning Strategies:	This module will be taught in three theory classes of one hour duration and one practical of two hours duration per week. Classes may take the form of formal lectures or tutorial-type sessions. A range of teaching techniques will be used as appropriate, including discussion of case studies, worksheets, PowerPoint and other presentations. Students will be encouraged to learn through questioning and group discussions. Factual material presented at theory classes will be reinforced, discussed and developed during practical classes.
Module Aim:	To give the student a sound background in the chemical composition, structure and functions of macro and micro nutrients and the metabolic reactions nutrients undergo in the body To provide the student with a basic introduction to the principles of pharmacology. To elucidate the importance of diet in health and disease. To provide an insight into the application of dietary principles
Learning Outcomes	
<i>On successful completion of this module the learner should be able to:</i>	
LO1	Describe the structure and functions of the major food components.
LO2	Explain how food is metabolised by the body
LO3	Distinguish between the essential and non-essential elements of diet.
LO4	Identify the nutrients in the main food groups
LO5	Recognise the importance of nutrients in the diets of healthy individuals and the role of diet in the treatment and cause of various illnesses.
LO6	Describe the basic principles of pharmacokinetics; the absorption, metabolism, mechanism of action and excretion of drugs.
LO7	Discuss the use and abuse of drugs in sport
LO8	Apply basic dietary planning principles
Pre-requisite learning	
Module Recommendations	
<i>This is prior learning (or a practical skill) that is recommended before enrolment in this module.</i>	
No recommendations listed	
Incompatible Modules	
<i>These are modules which have learning outcomes that are too similar to the learning outcomes of this module.</i>	
No incompatible modules listed	
Co-requisite Modules	
No Co-requisite modules listed	
Requirements	
<i>This is prior learning (or a practical skill) that is mandatory before enrolment in this module is allowed.</i>	
Successful completion of year 1 or equivalent	

Module Content & Assessment

Indicative Content

Theory Section 1.1

Structure of amino acids. Essential and non essential amino acids. Protein classification, structure and functions. Enzymes; classification, mode of action, heat and pH sensitivity, regulation, specificity, cofactors.

Theory Section 1.2

Structure and function of lipids. Glycerides, saturated and unsaturated fatty acids, essential fatty acids, phospholipids. Digestion, absorption and transport of lipids.

Theory Section 1.3

Sugars and polysaccharides. Structure and function of the chief monosaccharides and disaccharides. Structural and storage polysaccharides.

Theory Section 1.4

Function of water-soluble and fat-soluble vitamins and of minerals.

Theory Section 1.5

Introductory pharmacology: Factors involved in the absorption, distribution, metabolism and excretion of drugs. Pharmacokinetics and pharmacodynamics. Dose calculation and clearance rates.

Theory Section 1.6

Basic Mechanism of Drug Action: The drug-receptor complex. Multipharmacy - antagonism and synergism.

Theory Section 1.7

Introduction to the properties and use of drugs such as analgesics, anaesthetics and antibiotics.

Theory Section 1.8

Drugs in Sport: Legitimate therapeutic use of drugs. Performing enhancing drugs such as anabolic steroids and growth hormone. Blood doping. WADA, procedures for drug testing in sport.

Theory Section 2.1

Catabolic and anabolic metabolism. Metabolic control; location, compartmentation, hormonal control and feedback mechanisms.

Theory Section 2.2

Glycolysis, tricarboxylic cycle, the electron transport chain, the proton ion gradient and ATP generation. Gluconeogenesis.

Theory Section 2.3

Transamination and deamination. Detoxification of ammonia.

Theory Section 2.4

B-Oxidation of fatty acids.

Theory Section 2.5

The balanced and healthy diet: Diet planning principles, nutritional guidelines, graphic aids. Nutritional labels. Food technology.

Theory Section 2.6

The nutritional content of the main food groups; cereals, fruit and vegetables, meat, fish, eggs and protein alternatives, milk and milk products.

Theory Section 2.7

Life Cycle Nutrition: Normal diets for infants, young children, adolescents, adults, the aged, pregnant and lactating mothers.

Theory Section 2.8

Diets and Illnesses: Role of diet in the development and treatment of a range of illnesses and disorders such as PKU, Coeliac Disease, Obesity, Protein-Energy Malnutrition.

Practicals

The practicals are designed to reinforce and amplify the material covered in the lecture course and will include the following. Similar experiments may be substituted as necessary. Practical will cover Health and Safety in the laboratory; Qualitative analysis of foodstuffs and examination of food labels nutrient content and student diet; Quantitative measurement of protein; Determination of the isoelectric point of casein; Quantitative measurement of reducing sugars; Acid levels in milk; Separation techniques such as TLC and gel filtration; Properties, activities and assays of enzymes; Extraction and analysis of vitamin C from various sources; Molecular models; Separation of drugs by chromatography; Analysis of drugs by uv-spectroscopy and titration.

Assessment Breakdown

	%
Continuous Assessment	10.00%
Practical	40.00%
End of Module Formal Examination	50.00%

Special Regulation

Students must achieve a minimum grade (35%) in both the practical/CA and final examination.

Continuous Assessment

Assessment Type	Assessment Description	Outcome addressed	% of total	Assessment Date
Examination	In class continuous assessment examination	1,2,3,4,5,6,7,8	10.00	n/a

No Project

Practical				
<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Outcome addressed</i>	<i>% of total</i>	<i>Assessment Date</i>
Practical/Skills Evaluation	Weekly practical laboratory reports	1,2,3,4,5,6,7,8	40.00	n/a

End of Module Formal Examination				
<i>Assessment Type</i>	<i>Assessment Description</i>	<i>Outcome addressed</i>	<i>% of total</i>	<i>Assessment Date</i>
Formal Exam	3 hour written exam	1,2,3,4,5,6,7,8	50.00	End-of-Semester

SETU Carlow Campus reserves the right to alter the nature and timings of assessment

Module Workload

Workload: Full Time		
<i>Workload Type</i>	<i>Frequency</i>	<i>Average Weekly Learner Workload</i>
Lecture	30 Weeks per Stage	3.00
Laboratory	30 Weeks per Stage	2.00
Estimated Learner Hours	30 Weeks per Stage	1.67
Total Hours		200.00

