



University of Pretoria Yearbook 2017

Biochemical principles of nutrition and toxicology 262 (BCM 262)

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| Qualification | Undergraduate |
| Faculty | Faculty of Natural and Agricultural Sciences |
| Module credits | 12.00 |
| Programmes | BDietetics BSc Biochemistry BSc Biotechnology BSc Chemistry BSc Culinary Science BSc Ecology BSc Food Science BSc Genetics BSc Human Genetics BSc Human Physiology BSc Human Physiology, Genetics and Psychology BSc Medical Sciences BSc Microbiology BSc Nutrition BSc Zoology BScAgric Animal and Pasture Science BScAgric Animal Science |
| Service modules | Faculty of Health Sciences |
| Prerequisites | [CMY117 GS] and [CMY127 GS] and [MLB111 GS] |
| Contact time | 2 lectures per week, 90 minute practical per week |
| Language of tuition | Afrikaans and English is used in one class |
| Academic organisation | Biochemistry |
| Period of presentation | Semester 2 |



Module content

Biochemistry of nutrition and toxicology. Proximate analysis of nutrients. Review of energy requirements and expenditure. Respiratory quotient. Requirements and function of water, vitamins and minerals. Interpretation and modification of RDA values for specific diets, eg growth, exercise, pregnancy and lactation, aging and starvation. Interactions between nutrients. Comparison of monogastric and ruminant metabolism. Cholesterol, polyunsaturated, essential fatty acids and dietary anti-oxidants. Oxidation of fats. Biochemical mechanisms of water- and fat-soluble vitamins and assessment of vitamin status. Mineral requirements, biochemical mechanisms, imbalances and diarrhoea. Biochemistry of xenobiotics: absorption, distribution, metabolism and excretion (ADME); detoxification reactions: oxidation/reduction (Phase I), conjugations (Phase II), export from cells (Phase III); factors affecting metabolism and disposition. Toxic responses: tissue damage and physiological effects, teratogenesis, immunotoxicity, mutagenesis and carcinogenesis. Examples of toxins: biochemical mechanisms of common toxins and their antidotes. Antibiotics and resistance. Natural toxins from fungi, plants and animals: goitrogens, cyanogens, cholineesterase inhibitors, ergotoxin, aflatoxins Practical training in analyses of nutrients, fatty acids separations, antioxidant determination, and enzyme activity measurements, PO ratio of mitochondria, electrophoresis, extraction, solubility and gel permeation techniques.

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