Department of Clinical Sciences and Nutrition

Master of Science

in

Exercise & Nutrition Science

Dublin

Part-Time Taught Modular Masters Programme

Module Descriptor Outlines
**XN7515 Exercise & Health**

The science of exercise and health is a rapidly expanding field. The module aims to develop a thorough knowledge and understanding of the evidence investigating the links between physical activity and health, skills for the measurement and evaluation of health-related fitness and examine strategies the promotion of exercise in a variety of school, community and workplace contexts. Module content includes: Exercise & Health: an overview; risk or benefit? Exercise, fitness and health; physiology of exercise; exercise in prevention and treatment. Exercise in cardiovascular health and disease. Exercise and weight control. Assessment of health-related fitness: aerobic capacity; body fat; blood pressure; strength; flexibility; screening procedures in community and workplace settings. Assessment of physical activity and energy expenditure (e.g. cardiopulmonary parameters – e.g. VO2, METS, BP, HR, etc), accelerometry, pedometers, etc. Exercise in health promotion – school, community and workplace. Critical review of recommendations of frequency, intensity, type and time of exercise for optimal health benefits (e.g. ACSM, DoH, etc). Occupational health and fitness.

**XN7509 Nutrition in Health & Disease**

The module explores the scientific principles that underpin nutritional requirements for health, the scientific basis for current nutrition guidelines and the nature of diet and its relationship to the health of different groups within the population. It also reviews policies which affect nutrition, food choice and related matters and aims to develop practical analytical skills in nutritional assessment. Module content includes: Nutrition and health including review of the principal nutrients. Nutrition needs of different groups including eating behaviour and food choice. Healthy eating recommendations for the general public. Malnutrition: including protein, energy and micronutrient deficiencies. Dietary factors in cancer causation and prevention. Atherosclerosis, thrombosis and coronary heart disease - nutritional and lifestyle factors. Diabetes. Gall stones. Nutritional epidemiology and public health. Role of scientific advisory committees and regulatory agencies. Emerging concerns in nutrition and health.

**XN7514 Sports Nutrition**

This module aims to develop critical knowledge and understanding of sports nutrition by reviewing theoretical, research and practice-based work; to develop skills in critical analysis, particularly in relation to published research in this area; and to enhance students’ perception of professional and ethical issues related to research and practice in sports nutrition. The module present students with research and evidence-based practice in this specialised area of sports and exercise nutrition, aiming to develop students’ academic knowledge and skills of critical analysis and to foster reflective and ethical practice. It also aims to enhance students’ perception of professional and ethical issues related to research and practice. Module content includes: Energy for exercise: an overview of energy systems and fuels. High intensity versus low intensity exercise. Review of literature related to the role of carbohydrate, fat and protein during different exercise intensities. Fluid balance: related research. Nutritional ergogenic aids. Sports nutrition in practice: working with elite and club level athletes. Methods of dietary analysis in research and field situations. Professional and ethical issues in sports nutrition. Determinants of eating behaviour; related research.
XN7512 Research Methods & Data Analysis

This module aims to expose students to the essential elements in the process of conducting sound scientific research and develop skills in the key aspects of data handling and statistical analysis in preparation for the planning and completion of the Research Project.

Module content includes: Scientific parlance (hypothesis, concepts, operational definitions, dependent/independent variables), sampling procedures and measurement issues (reliability and validity). Research and data collection methods: experimental research (developing hypotheses, independent/dependent variables, controls, sample selection, study designs, and experimental validity); descriptive research (questionnaires and interviews, case studies); qualitative research (characteristics, procedures, methods of data collection, data analysis, and internal/external validity). The nature of research; scientific methods of enquiry, pure versus applied ways of problem solving. Developing the research problem; identifying a topic area, devising specific questions, discovering what is already known (reviewing the literature), determining feasible ways to answer the questions. Ethics in research. Introduction to data analysis software (SPSS for Windows). Establishing an SPSS database. Defining and transforming variables; data storage and retrieval. Data analysis for descriptive and experimental research; descriptive statistics. Describing data; measures of variability, correlation and multiple correlation, scatter plots and prediction analysis (regression). Inferential statistics. Selecting appropriate tests (parametric or non-parametric), and types of statistical tests (chi-square; t-tests; one-way ANOVA & post-hoc tests; Wilcoxon, Mann-Whitney U). Repeated Measures ANOVA & Intraclass correlation; Factorial ANOVA. Limits of agreement analysis for method comparison and test retest reliability. Worked examples in SPSS.

XN7508 Performance Enhancement

This module explores contemporary methods of performance enhancement, giving insights and critical appreciation into the effectiveness of selected practises and substances. The module is designed for any student with a professional or personal interest in enhancing human performance irrespective of gender, age, ability or culture.

Module content includes: Biotechnology of performance enhancement. Role of performance enhancement within current and future sport and exercise contexts. Exercise issues: sports science of training; energy power systems; peak performance; paediatric training; exercise and immune function. Nutrition issues: macro nutrient intake for exercise; carbohydrate feeding; ergogenic properties of medium chain triglycerides; amino acid supplementation; micro-nutrient intake for exercise; creatine supplementation; anti-oxidants and vitamin supplements; mineral supplements; alkalisising agents; hydration and electrolyte balance. Performance enhancement modalities and health implications.

XN7501: Physiology & Physical Performance

The module critically reviews the responses and adaptations of the physiological systems to physical activity. It also takes an evidence-based approach to discussion of current theories regarding the limits to human performance.

Module content includes: Homeostasis: rest, exercise and recovery integrative responses and control mechanisms. Physiology of anaerobic and aerobic metabolism: energy substrate utilisation; neurohormonal control mechanisms, thermoregulation mechanisms; fluid balance. Physiology of the cardiovascular,
respiratory and neuromuscular systems during exercise; maximum oxygen uptake: measurement and evaluation; physiological limits to maximal aerobic physical performance; inter-relationships between workload and HR/BP/VO₂/VCO₂/VE. Resting and exercise ECG assessment and interpretation.

**XN7519 Research Project**

Successful completion of all taught/compulsory modules; preparation of an approved research proposal, ethical approval
Following completion of six taught modules, MSc students are required to undertake a programme of personal research on a topic of relevance to exercise and nutrition science. Projects may be laboratory-based in the university or workplace-based and may utilise a range of methodological approaches and traditions; whilst some projects will be experimental others will adopt more qualitative methods. It is envisaged that many of those students who are in employment will undertake projects in collaboration with their employer. Throughout the research stage of their studies all students are under the guidance and direction of the Research Co-ordinator and an individually allocated supervisor. It is a responsibility of the Research Co-ordinator to maintain an overview of all students at the research stage to ensure that research projects are consistent with the aims and objectives of the programme. The module will consist of the submission of a project report and literature review.

**XN7521 Independent Study (Exercise Science)**

Exercise science is a wide-ranging and interdisciplinary subject that may be considered from a variety of perspectives. The module enables students to take the lead on the subject content to be studied and to focus the 4,000-word written assignment on a specific self-selected topic. The topic and structure of the assignment must be agreed with the module tutor in advance. This may be, for example, a case study, a critical review of literature, a mini-project, etc. On completion of this module the student will have: (i) demonstrated critical application of in depth knowledge and understanding of an agreed exercise-related topic; (ii) utilised relevant research skills (e.g. literature review, data collection, analysis and communication) in the preparation of a written report; (iii) demonstrated the project planning and management skills required to complete a negotiated task to agreed deadlines and specifications.

The module requires tutorial attendance by arrangement with the module tutor.

**XN7522 Independent Study (Nutrition Science)**

Nutrition science is a wide-ranging and interdisciplinary subject that may be considered from a variety of perspectives. The module enables students to take the lead on the subject content to be studied and to focus the 4,000-word written assignment on a specific self-selected topic. The topic and structure of the assignment must be agreed with the module tutor in advance. This may be, for example, a case study, a critical review of literature, a mini-project, etc. On completion of this module the student will have: (i) demonstrated critical application of in depth knowledge and understanding of an agreed nutrition-related topic; (ii) utilised relevant research skills (e.g. literature review, data collection, analysis and communication) in the preparation of a written report; (iii) demonstrated the project planning and management skills required to complete a negotiated task to agreed deadlines and specifications.

The module requires tutorial attendance by arrangement with the module tutor.