

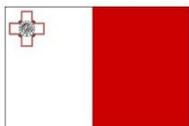
## NEW MASTERS PROGRAMMES AT MCAST

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All Masters are at EQF Level 7 - 90 ECTS. Entry requirements are a relevant first degree and ideally two years of relevant work experience. All programmes will run on a blended learning format, with approximately 30% via eLearning modules, and the remainder via weekend sessions that run on Friday evenings and Saturday mornings.

- Further information can be acquired from:
- [university.college@mcast.edu.mt](mailto:university.college@mcast.edu.mt)
  - [www.mcast.edu.mt](http://www.mcast.edu.mt)
  - +356 2398 7176
- Applications can be submitted online at:
- <https://shortcourses.mcast.edu.mt/courses/MASTERS>
- Application closing date: 15<sup>th</sup> March 2019

**These courses are currently being part-financed by the European Union through the European Social Fund under ESF 3.003 – Development of Training Programmes at MQF Level 7.**



Operational Programme II – European Structural and Investment Funds 2014-2020  
*“Investing in human capital to create more opportunities and promote the well-being of society”*

Project part-financed by the European Social Fund  
Co-financing rate: 80% European Union Funds; 20% National Funds



# MASTER OF SCIENCE IN ENVIRONMENTAL ENGINEERING

CODE: UC7-E7-18  
Launching April 2019



The Master of Science in Environmental Engineering programme takes an interdisciplinary approach into the investigation of processes that control the earth and its environment. The programme will deliver all necessary knowledge and skills to seize opportunities presented by new developments in areas such as global cycles, biogeochemistry, sustainable technologies, waste and water treatment, environmental pollution assessment and remediation, and natural hazard. A special focus on environmental auditing and impact assessment shall be made, particularly in water, energy, noise and traffic auditing.

## **Learning Outcomes:**

Upon successful completion of this Masters Programme the participants will be able to: evaluate the performance of an engineering system and incorporate innovations or implement new technologies; enhance environmental protection; collect, construct and evaluate environmental impact data; apply their knowledge in the fields of energy efficiency, waste water treatment, marine protection and water resource management; use logic and reasoning to identify the strengths and weaknesses of alternative environmental sustainability solutions.

## **First Year (Semesters 1 & 2: 30 ECTS) – Exit Option: Post Graduate Certificate**

1. Introduction to Environmental Engineering
2. Environmental Impact Assessment
3. Environmental and Soil Science
4. Ecosystem Analysis and Management
5. Energy Efficiency and the Environment

## **Second Year (Semesters 3 & 4: 30 ECTS) – Exit Option: Post Graduate Diploma**

6. Marine Pollution
7. Renewable Energy Technologies
8. Air Pollution and Monitoring
9. Sustainable Urban Transport
10. Electives:
  - 10.1 - Water Resources and the Environment
  - 10.2 - Water Contamination and Remediation

## **Third Year (Semester 5: 30 ECTS) – Final Exit: Masters**

Dissertation

# MASTER OF SCIENCE IN HIGH PERFORMANCE BUILDINGS

CODE: UC7-E13-18  
Launching April 2019



The Master of Science in High Performance Buildings (HPB) gives candidates the opportunity to develop optimized building concepts, integrating various components of holistic design methodology, building physics, building climatology and comfort, energy-efficiency, environmental sources, building services systems, building aerodynamics, thermal and fluid dynamic CFD simulations, lighting design, building operation, as well as green urban modelling. The programme provides for advanced skills in specialization and scientific research of building physics coupled with architectural design, preparing students for professional, as well as research and development settings at national and international levels.

## **Learning Outcomes:**

Upon successful completion of this Masters Programme the participants will be able to: design holistically in order to unify passive and active building technology solutions and to integrate building into a larger context; responding to, and take advantage of, current environmental circumstances, potentials and synergies; integrate special aspects of HPB-related physics and design methods into the regular planning procedure; think as engineers of the various corresponding fields involved in design and construction, thus being able to act as an interface between design participants; strengthen the dialogue between the various professional disciplines, coordinating them in accordance with desired HPB project goals.

## **First Year (Semesters 1 & 2: 30 ECTS) – Exit Option: Post Graduate Certificate**

1. High Performance Building (HPB) Design Approach
2. Building Climatology
3. Building Energy
4. Building Aerodynamics
5. Energy and Climate Dynamic Building Simulations

## **Second Year (Semesters 3 & 4: 30 ECTS) – Exit Option: Post Graduate Diploma**

6. Aerodynamic Building Simulations
7. High-Performance High-Rise Buildings
8. High Performance Settlements (HPS)
9. Project 1 – Building Design Project (HPB)
10. Project 2 – Settlement Design Project (HPS)

## **Third Year (Semester 5: 30 ECTS) – Final Exit: Masters**

Dissertation

# MASTER OF SCIENCE IN INTEGRATED WATER RESOURCE MANAGEMENT

CODE: UC7-E8-18  
Launching April 2019



The Master of Science in Integrated Water Resource Management programme shall impart in-depth knowledge and practical experience in applied science aspects of water systems in small island states, with a focus on water measurement, water sustainability, water consumption, water chemistry, microbiology and analytics. The course comprises a range of practical modules in water metering, sensing and measurement, applied microbiology, biofouling/biocorrosion, chemometrics, environmental microbiology and water chemistry.

## **Learning Outcomes:**

Upon successful completion of this Masters Programme the participants will be able to; have learned the basics in natural sciences, environmental hydraulics, hydrology and water resource management; be acquainted with water management related topics such as flood risk, hydrology, water system engineering, watershed management, water supply and demand, water system analysis; be able to apply their knowledge in all areas of water resource management, water supply, waste water treatment and solid waste management; be able to search for responses to the worldwide problems of increasing water scarcity, flood risks and environmental pollution; meet the growing demand for advanced knowledge in water resources and their use in the urban, industrial, and agricultural environment, including political and policy aspects of water use as well as an understanding of the economics involved.

## **First Year (Semesters 1 & 2: 30 ECTS) – Exit Option: Post Graduate Certificate**

1. Introduction to Water Resource Management
2. Climate Change Mitigation and Adaptation
3. Environmental Impact Assessment
4. Water System Modelling
5. Water Biology

## **Second Year (Semesters 3 & 4: 30 ECTS) – Exit Option: Post Graduate Diploma**

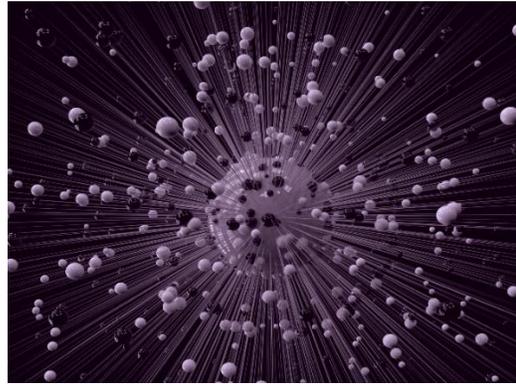
6. Water Production, Distribution and Harvesting
7. Water Technologies
8. Water Management
9. Water Conservation
10. Water Efficiency

## **Third Year (Semester 5: 30 ECTS) – Final Exit: Masters**

Dissertation

# MASTER OF ARTS IN PRODUCT DESIGN

CODE: UC7-E11-18  
Launching April 2019



The Master of Arts in Product Design programme develops the artistic and humanistic skills belonging to design culture together with the technical know-how that relates to production technology, materials, and manufacturing costs. It strives to meet the need of operating in a worldwide landscape of heightened competition where the designer can increase the value of a consumer product by creating innovation – in both aesthetics and usability – that takes advantage of available technologies and ever-changing consumer lifestyles. Candidates will build an improved critical capability to explore contemporary design languages, focus on experimentation with innovative inter-disciplinary technologies and materials, from preliminary concept to finish, and focus on understanding and developing sustainable production and consumption processes.

## **Learning Outcomes:**

Upon successful completion of this Masters Programme the participants will be able to: demonstrate the techniques of representation and prototyping, and the usage of innovative materials and processes, as well as controlling the functional, performance and usability aspects in relation to the social and cultural phenomena related to design; learn about the quantitative and qualitative data aspects of the discipline in order to pursue the profession at an international level or to further pursue studies; capture clearly and effectively the essential contents of communication, including the use of computers, as well as to manage communication through data processing, physical illustrations and digital elaborations; master additional communication skills including those required for an audience of teachers or external subjects of different genres; have an appreciation of the social context of customer demands and be able to evaluate different design choices focusing on economic aspects, while also taking into account social, environmental and ethical consequences.

## **First Year (Semesters 1 & 2: 30 ECTS) – Exit Option: Post Graduate Certificate**

1. Product Representation
2. Design Issues
3. Optimisation of Topology and Design
4. Theoretical and Applied Mechanics
5. Mechanical Tests, Models and Prototypes

## **Second Year (Semesters 3 & 4: 30 ECTS) – Exit Option: Post Graduate Diploma**

6. Principles of Product Design
7. Product Design Studio
8. Human-Centred Product Design
9. Internet of Things (IoT)
10. Culture and Communication

## **Third Year (Semester 5: 30 ECTS) – Final Exit: Masters**

Dissertation

# MASTER OF SCIENCE IN MECHATRONICS

CODE: UC7-E12-18  
Launching April 2019



The Master of Science in Mechatronics programme provides students with a broad range of knowledge and skills in the field of automation and control of production processes and equipment, as well as in the field of mechatronic devices and systems control. It focuses on the study of network technologies (e.g. Ethernet, Industrial Protocol, Profinet, Modbus, Profibus, Devicenet, Control Net), and development of SCADA system (Supervisory Control and Data Acquisition) construction. Practical use of real-time systems is also an important part of the programme. Students shall apply the theoretical principles of industrial robotics and mechatronics, mechatronic and robotic actuators, and modern technologies of microcontroller applications.

## **Learning Outcomes:**

Upon successful completion of this Masters Programme the participants will be able to: recognize the purpose, functioning and need for mechatronic systems in modern industry and everyday life as true interdisciplinary systems; achieve engineering expertise in the choice and analysis of mechanisms, sensors, actuators and controllers as components of a mechatronic system; the ability to model and design mechatronic systems based on customer requirements and best practice examples; the ability to design a stand-alone mechatronic system based on user-case specifications; the ability to integrate a mechatronic system as an intelligent upgrade of an already functioning system in industry; the ability to carry out development projects independently and in teams.

## **First Year (Semesters 1 & 2: 30 ECTS) – Exit Option: Post Graduate Certificate**

1. Mechanisms and Machine Design
2. Mechatronic System Design
3. Control Systems Technology
4. Signals and Systems
5. Industrial Robot Design and Control

## **Second Year (Semesters 3 & 4: 30 ECTS) – Exit Option: Post Graduate Diploma**

6. Practical Control and Applications in Mechatronic Systems
7. Software Design and Analysis
8. Computational Modelling and Simulation of Dynamic Systems
9. Industrial Robot Programming and Applications
10. 3D Technologies in Mechatronic System Design

## **Third Year (Semester 5: 30 ECTS) – Final Exit: Masters**

Dissertation

# MASTER OF SCIENCE IN EXERCISE AND SPORTS SCIENCE

CODE: UC7-E10-18  
Launching April 2019



The Master of Science in Exercise and Sport Science presents a multidisciplinary focus to help students understand the relationship between health and human performance. As an academic program, the Masters of Science will introduce translational research and provide essential foundations from the bases of physiology, biomechanics, motor behavior, and psychology. Using the social ecological approach to addressing the needs for health and human performance for the workforce in Malta, the program recognizes societal needs, introduces evidence-based strategies for intervention, and evaluates the impact of these services on health outcomes and productivity.

## **Learning Outcomes:**

Upon successful completion of this Masters Programme the participants will be able to: conduct a needs analysis to identify areas for improvement which benefit the individual, groups, and organizations seeking to promote improved human performance; understand advanced concepts of exercise physiology and exercise /sport psychology as it pertains to applied science; read and interpret research which supports best practices in Exercise and Sports Science; design, write and orally present a plan for an exercise /wellness intervention; evaluate the effectiveness of an intervention using sound assessment principles; analyze individual and group sport training and physical activity programs to ensure that recognized standards of practice for exercise testing, exercise prescription and exercise leadership are followed.

## **First Year (Semester 1 & 2: 30 ECTS) – Exit Point: Post Graduate Certificate**

1. Fundamentals of Exercise and Sports Science
2. Applied Psychology in Fitness, Exercise and Health
3. Exercise Physiology: Applications for Health and Human Performance
4. Research Methods in Exercise and Sports Science
5. Principles of Wellness Coaching

## **Second Year (Semester 3 & 4: 30 ECTS) – Exit Point: Post Graduate Diploma**

6. Exercise Prescription and Therapy for Non-Communicable Diseases
7. Advanced Assessment and Interpretation for Human Performance
8. Advanced Sport Performance Training Techniques
9. Planning for Community-Level Interventions
10. Multidisciplinary Work in Exercise and Sports Science

## **Third Year (Semester 5: 30 ECTS) – Final Exit: Masters**

Dissertation