SEMINAR ON BIOMEDICAL ENGINEERING

Engineering Lecture Theatre (ELT) – Faculty of Engineering, University of Malta
Friday 23rd March 2018 – 12:00 to 16:00

The Department of Metallurgy and Materials Engineering in collaboration with Microtek Medical Malta – A division of Ecolab Inc. are organising a two-hour seminar on biomedical engineering.

If you are interested in attending this event please send an email to joseph.p.buhagiar@um.edu.mt before Wednesday 21st March 2018.

12:00 – 12:30	**Teaching and Active learning on the Maintenance of Biomedical Equipment** Ing. Néstor Flórez Luna Universidad del Rosario - Sede Quinta de Mutis, Bogotá, D.C. -Colombia
12:35 – 12:55	**Hips Don't Lie - Simulating Their Honesty*** Mr. Donald Dalli MALTAHIP Project, University of Malta, Msida, Malta
13:00 – 13:40	**Medical Devices: From Concept to Launch** Inġ André Spiteri and Inġ Marvic Debono Microtek Medical Malta – A division of Ecolab Inc., Mosta, Malta
13:45 – 14:00	**Tribocorrosion enhancement of implant-grade biomedical stainless steel using dual-layered PVD coatings and low temperature carburising** Mr. Antonino Mazzonello University of Malta, Msida, Malta
14:05 – 15:00	Light refreshments and networking

* exact replica of the winning presentation that was presented at the International Final for the Speak Out for Engineering (SOFE) competition that was held in New Zealand

Teaching and Active learning on the Maintenance of Biomedical Equipment
Ing. Néstor Flórez Luna | Friday 23rd March 12:00 – 12:30
Universidad del Rosario - Sede Quinta de Mutis, Bogotá, D.C. -Colombia

Abstract: The Colombian School of Engineering Julio Garavito and the School of Medicine and Health Sciences of Universidad del Rosario, Biomedical Engineers have developed a Biomedical Engineering programme together that applies a methodology of theoretical and practical teaching in an academic environment. This is done with the aim that the student understands the working principles of biomedical equipment and acquires the ability to read and interpret the diagrams and schematics, to review and detect failures, resolve them directly, perform the required maintenance and finishing by testing analytically the operation of the repaired equipment. The objective is to train the student to face and solve technical problems in health care centres and biomedical equipment distribution companies.

Note: This talked is being affected under the Erasmus Plus International Credit Mobility.

Biography: Ing. Néstor Flórez Luna is a lecturer in the Biomedical Engineering Programme that is run jointly between The Colombian School of Engineering Julio Garavito and the School of Medicine and Health Sciences of Universidad del Rosario in Colombia. Ing. Flórez Luna served in the Health division of the National Army of Colombia between 1985 and 2005 where he was head of maintenance on medical equipment. He was a lecturer at Universidad Manuel Beltran (2002 and 2012) and the Colombian School of industrial degrees ECCI (2008 – 2012). Between 2008 and 2011 he was head of technical service at B. Braun Medical S.A.

Hips Don't Lie - Simulating Their Honesty
Mr. Donald Dalli | Friday 23rd March 12:35 – 12:55
MALTAHIP Project, University of Malta, Msida, Malta

Abstract: Walking, sitting down and standing are some of the daily activities that are easily taken for granted. Yet such seemingly simple tasks involve the precise harmony of biological mechanisms inside the lower limbs. A key component in these mechanisms is the hip joint. Like any other biomechanical system, the hip is prone to medical complications, such as cartilage wear, joint inflammation and bone fracture. Such negative implications could lead the affected individual to implant an artificial prosthetic replacement. Biomechanical assurance of prosthetic hips is attained through meticulous testing inside mechanical hip joint simulators. In light of this, a new hip joint simulator is being constructed at the University of Malta to augment research in the development of prosthetic hip joints. The underlying principle behind the hip joint simulator is to replicate the in-vivo conditions, as well as the motion and load profiles typically exhibited during activities of daily living.

Note: This presentation is the exact replica of the winning presentation that was presented at the International Final for the Speak Out for Engineering (SOFE) competition that was held in New Zealand.
ttps://www.um.edu.mt/newspoint/news/features/2018/02/maltesedoctoralstudentplacesfirstininternationalengineeringcompetition

Biography: Donald Dalli graduated in Bachelor of Mechanical Engineering from the University of Malta with first class honours in 2014. During his bachelor degree, Donald Dalli worked as a student engineer at Dold Industrial Automation Ltd. He then followed a Master's Degree at the same University focussing on mechatronic system design and graduated with a distinction in 2015. At the same time, Donald Dalli was working with IBG Automation Malta Ltd, specializing in factory simulations, robot programming and software development. Donald Dalli joined the University of Malta again in 2017 and was appointed as a Research Support Officer II under the Department of Metallurgy and Materials Engineering working on the MALTAHIP project, and at the same time he is also pursuing his doctoral degree. The MALTAHIP project is funded by the Malta Council for Science and Technology through FUSION: The R&I Technology Development Programme 2016 (R&I-2015-023T).

Medical Devices: From Concept to Launch

Inġ André Spiteri and Inġ Marvic Debono | Friday 23rd March 13:00 – 13:40

Microtek Medical Malta – A division of Ecolab Inc., Mosta, Malta

Abstract: Medical Devices manufacturing is a highly regulated field mainly due to the high risk involved during actual product use. Medical devices are classified into different classes depending on the intended use and associated risk during use. Classification impacts the regulatory requirements for the device, as well as the approval route to be followed. Before medical device manufacturers can legally CE mark their products in Europe, they must comply with the appropriate medical device regulation set forth by the EU Commission. EN ISO 13485 is a quality system standard designed specifically for medical device manufacturing companies. This standard establishes a framework for the processes involved during a medical device life cycle, from the initial concept through obsolescence of product in order to meet the requirements for the European market. These requirements ensure the provision of medical devices that consistently and safely meet customer requirements.

Biography of Inġ André Spiteri: He graduated with a Bachelor in Mechanical Engineering at the University of Malta. In 2011 he was awarded a Masters in Engineering with distinction also at the University of Malta. The Masters by research within the Department of Metallurgy & Materials Engineering focused on surface treatment technologies on medical materials, laboratory analysis and sample processing. Following his Masters André joined Microtek Medical Malta ltd, a Division of Ecolab. Ecolab healthcare specialises globally in providing healthcare products and services. Microtek Medical focuses on Medical Device Development and Manufacturing. André followed different roles within the company varying from process improvement, RDE and supply chain.

Biography of Inġ Marvic Debono: She graduated in Mechanical Engineering from the University of Malta in 2011, after which she started working as a Quality Assurance Manager at a division of Ecolab. Ecolab Healthcare is a global company providing a comprehensive array of sustainable infection prevention solutions targeted at healthcare facilities with goal of delivering a cleaner, safer and healthier environment. In her role, Marvic is responsible for implementing and maintaining a quality management system in accordance to the applicable medical devices standards and regulations. Marvic is also involved in manufacturing process improvements, medical devices sterilization processes, RDE & product quality failures resolutions.

Tribocorrosion enhancement of implant-grade biomedical stainless steel using dual-layered PVD coatings and low temperature carburising

Mr. Antonino Mazzonello | Friday 23rd March 13:45 – 14:00

University of Malta, Msida, Malta

Abstract: The longevity of total hip replacement implants is largely dictated by their biocompatibility and their susceptibility to degrade in vivo. Degradation is partly inflicted by the simultaneous action of corrosion and wear, a phenomenon termed tribocorrosion. Biomedical grade 316LVM stainless steel is a metallic biomaterial that, despite having very good corrosion resistance afforded by a self-healing nanometric passive film, displays poor tribocorrosion response. Consequently, a surface treatment was carried out on 316LVM stainless steel, composed of a carbon-diffused layer, a cobalt-based metallic layer and a top ceramic coating. Tribocorrosion tests on the multi-layered coating revealed enhanced mechanical load-bearing capabilities, superior wear and corrosion resistance and a lower friction coefficient when compared to the untreated material. This resulted in a decreased wear volume by an order of magnitude. As such, the promising results of this novel surface treatment may encourage the use of multi-layered coatings as potential candidates for use in hip joint implants.

Biography: Antonino Mazzonello graduated as a Scientist in 2015 with First Class Honours in B.Sc. Chemistry with Materials. Two years later he obtained his M.Sc. in Mechanical Engineering where he studied the effect of thin ceramic coatings on the durability of implant grade biomedical stainless steel for use in hip replacement implants. Antonino has also published part of his research in a conference paper which has been presented during the EUROCORR 2017 Annual Congress. During his Masters, Antonino also worked as a casual support scientist within the Department of Metallurgy and Materials Engineering where he provided analytical and testing services to local industrial clients. He is currently a Ph.D. student at the University of Malta and is being funded via the Endeavour Scholarship Scheme. His project is a direct attempt at improving the current health care system by making such implants more durable, and in turn minimising the costs of operations as well as the burden on the patients themselves.