

Postgraduate study in dental material

MSc (1 year)

Programme Description

This degree is aimed at dental surgeons, materials scientists and engineers wishing to work in the dental support industries, and the materials health sector generally.

This MSc in Dental Materials is an advanced study programme designed to develop a significantly broad knowledge of the principles underlying the mechanical, physical and chemical properties of dental materials. Furthermore the structural properties of materials both at micro and macro levels are taught at postgraduate level.

Special emphasis is placed on materials – structure property correlations in the context of both the clinical and non clinical aspects. The theoretical courses are reinforced by practical research experience.

This MSc in Dental Materials provides students with the necessary tools and principles of Dental Materials that are currently used in Clinical Dentistry and covers the underlying principles of bioactivity and biocompatibility. The taught courses are complimented by research projects that are based on both the student's and staff's research interests.

On completion of the course the student should have a good knowledge of topics related to dental materials and in addition be competent in justifying selection criteria and manipulation instructions for all classes of materials relevant to the practice of dentistry.

Entrance Requirements:

You should have a first degree with a minimum of second class honours, in a subject relevant to dentistry, basic sciences, medical/bioengineering or the equivalent in professional qualifications and experience.

Programme Structure

First Year

Semester I	Material Research Techniques	Dental Material I	Biomaterials I	Material Research Project	Advance Ceramics	Biomechanics
Semester II	Materials Research Techniques	Dental Material II	Biomaterials II	Advanced Topics in Dental Materials	Tissue Engineering	Material Selection and Design

Second Year

Dissertation in Dental Material

Course details

Materials Research Techniques

Description

Introducing students to a wide range of experimental techniques and analytical processes that will underpin most research programmes in the field of materials. Lectures are provided by experts in the specific topic and includes an introduction to the underpinning theory as well as practical insights into the use of a technique, method or apparatus. This double module also provides guidance on planning research and writing reports and theses.

Dental Materials I & II

This unit will provide an understanding of the interaction between materials used for prosthetic devices or restoratives in the oral cavity and face and the tissues being replaced. It will explore the ethical and legal requirements for the evaluation of materials as medical devices.

Materials Research Project

Description

A four unit project that focuses on an aspect of research relevant to an academic staff member's interests. In the case of Project Management and Technology Management students, this module focuses on aspects of Technologies that are currently departmental priorities.

Advanced Ceramics

Review to physical and structural origin of the mechanical, electrical and optical properties of ceramics. Relate this knowledge to their applications and commercial importance. Review the processing and characterisation of ceramics. (Particular reference will be made to the following structural ceramics: alumina; silicon nitride; zirconia; and silicon carbide.) Review of functional ceramics, throughout the course the students will develop their knowledge so that they can relate structure, properties and applications.

Advanced Topics in Dental Materials

Description

This course will provide students with knowledge of Advanced Dental Materials enabling them to understand links between materials and dentistry. In addition it will help them in understanding the hard and soft materials, interfaces, biocompatibility, surface modification and their characterisation, and how these elements play a vital role in the

success of dentistry. Applications of Materials Science to Dentistry is a subject, which is growing recently. Certain dental materials, particularly amalgam restorative materials and titanium implant materials have already been used and researched significantly; the current research emphasis is on tooth- coloured dental restorative materials. Therefore, there is a need to understand the new dental materials used for direct filling, prosthodontic, bonding of crowns, bridges etc., Polymers, ceramics and their composites are used for such applications in dentistry and will be covered in this course.