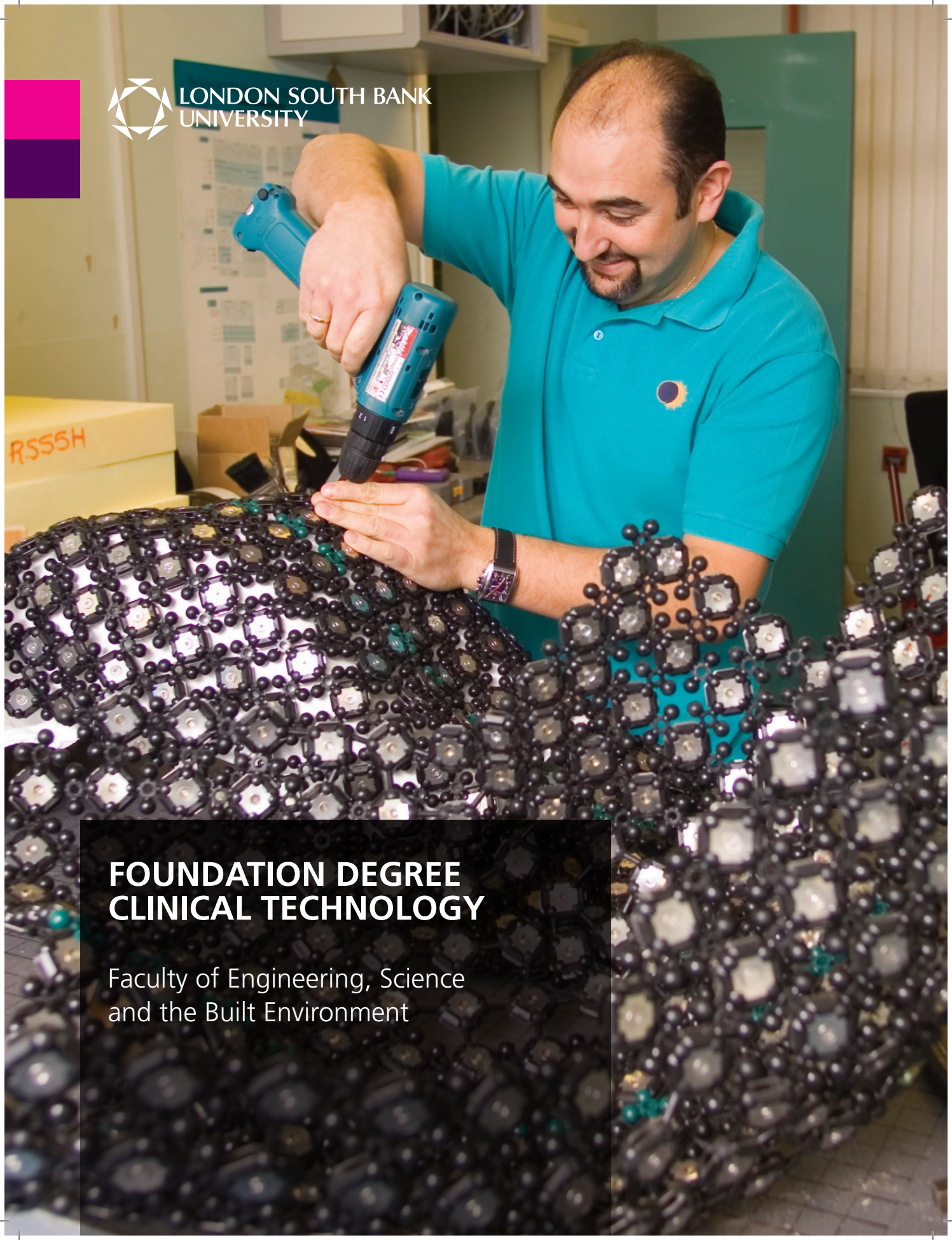

FOUNDATION DEGREE CLINICAL TECHNOLOGY

Faculty of Engineering, Science and the Built Environment

About London South Bank University

At London South Bank University (LSBU) we offer choice through our wide range of vocational courses and our flexible approach to learning.

Established in 1892, LSBU is one of the capital's oldest and largest universities with over 25,000 students.

Course Overview

The foundation degree in Clinical Technology has been developed by the Faculty of Engineering, Science and the Built Environment for several reasons:

- There is a recognised skills gap. This has come about because of an ageing workforce and few apprenticeships available during the 1980s and 1990s
- There is a growing requirement for special seating, orthotics and prosthetic devices in the UK due to the increase in diabetes, an aging population and casualties from conflict zones
- The development of new technology offers opportunities for exploring innovative technological solutions that improve the service for the user whilst simultaneously cutting costs.

Course Aims

This foundation degree has been developed to support technical and support staff working within rehabilitation settings such as prosthetics, orthotics, and special seating. The programme of study has been formulated to broaden, deepen and extend the experience gained in the work place.

The aims of the course are:

- To prepare students for careers in the design and fabrication of orthotics, prosthetics and special seating (bespoke wheelchairs)
- To provide knowledge and understanding of the relationships between special seating, orthotics and prosthetics and engineering design and manufacture
- To equip students with an understanding of existing assistive technologies and the need for technological innovation
- To support holistic person-centred long term rehabilitation and collaborative working in health and social care
- Encourage the development of a reflective, critical and flexible approach to rehabilitation therapy within the context of the rapid changes occurring in health and social care services
- Provide an appreciation of how human anatomy, physiology and biomechanics impact on rehabilitation
- To develop written, verbal and non-verbal communication skills appropriate for working with clients with complex needs and their care givers.

Course Content

The programme of learning provides an opportunity for a craftsperson/technician to progress to technician/engineer. There are four main core subject areas:

- Mechanics – with emphasis on solid mechanics with elements of biomechanics
- Materials -including biomaterials
- Manufacturing and design
- Clinical rehabilitation

Module Overview

Applied Mathematics 1

This module is offered to a number of engineering courses at foundation level. It aims to establish a foundation in elementary mathematical skills. There is a special emphasis on arithmetic and algebra since they constitute an essential basis for the development of further skills. The topics include algebra, coordinate geometry, vectors and calculus.

Engineering Science 1

The module provides a basic grounding in Engineering Science. It covers SI (standard international) units, Newton's Laws of Motion, fluid pressure and viscosity, and material elasticity. You will learn to differentiate between kinetics, statics, and mechanics in relation to mass, forces and equilibrium.

Clinical Materials

Covering the properties, manufacturing and fabrication of conventional engineering materials as well as materials used specifically in clinical technology, the module introduces the principles governing the selection of materials in load bearing applications within a clinical context. For example, prosthetics, orthotics and wheelchair design. The module also covers some basic stress analysis relating to materials and the analysis of failure modes appertaining to materials in clinical service. The module includes practical laboratory sessions.

Human Anatomy and Physiology

You will become familiar with the way the body is structured into organs and systems. It will encourage you to consider the specific role of organs and systems and examine the relationship the systems have on each other in a healthy individual.

It will also introduce students to revision and examination techniques to help prepare for the final assessment of this module.

Introduction to Rehabilitation

The module is designed to enable you to acquire the fundamental skills of rehabilitation using a biopsychosocial model of rehabilitation. It will also address the issue of accountability and principles of personalised care, assessment, goal setting, treatment techniques and outcome measures.

Long Term Conditions and Rehabilitation

The module is designed to reflect the National Service Framework for Long Term Conditions and "Your health, your way - a guide to long term conditions and self care". The core components include supporting people with long-term conditions, promoting well-being and community engagement, prevention, early intervention and personalised care planning.

Clinical Mechanics

Covering engineering mechanics (solid) and biomechanics (chiefly of human locomotion) within the context of the design and development of clinical technology, you will study the kinematics of mechanisms and linkages with applications in prosthetic devices such as knee joints and the design of wheelchairs.

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Prosthetics, Orthotics and Special Seating

The module encompasses a basic treatment of mechanics and the selection of materials as they relate to the engineering design of clinical technology. The module covers three main areas: wheelchairs, prosthetics, and orthotics. You will be assessed on two of these (one of which should relate to the student's work place). This module will involve case studies delivered by guest lecturers who are experts in the field.

Engineering Mathematics and Modelling (IEng)

This module introduces the main mathematical techniques that are required in the early stages of engineering degrees, including the use of mathematical software. The topics include complex numbers, trigonometry and calculus, curve sketching, geometry and matrix and vector algebra. The module is delivered to a range of engineering degrees, including those that emphasise design, that lead to Incorporated Engineer status.

Engineering Design and Product Development

This module is intended to extend your understanding of engineering design. The module aims to enable you to appropriately select and then apply established design theory alongside product development and prototyping techniques to effect comprehensive solutions to engineering problems.

Work Based Project

This module involves the design and manufacture of an artefact used in clinical technology. The construction should be carried out in the workplace. You will investigate the design criteria in detail, for example, the loads involved and how this relates to the geometry and the choice of materials. You will gain an appreciation of how the engineering design and associated technology has evolved through history and how these changes relate to the service user's individual needs.

Duration

This two year course is offered on a one-day a week basis. The course incorporates work-based learning programmes. Students can only be accepted onto the course if they are able to undergo work-based learning.

Course Contact

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Course Planning & Development Team

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External Partners

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Points of Reference

The panel for the validation of this programme included Michael O'Byrne, a leading industrialist in the field of prosthetics and chair of the British Healthcare Trades Association prosthetic section.

International Society for Prosthetics and Orthotics (Category II), May 2010.

Joint Statement on Foundation Degrees for Support Workers, British Association of Prosthetists and Orthotists (BAPO), the British Dietetic Association (BDA), Chartered Society of Physiotherapy and others, Sept 2006.