MSc in Orthopaedic Engineering

Programme (Scheme) Specification

Introduction

This Programme (Scheme) Specification is a concise summary of the main features of the MSc in Orthopaedic Engineering and of the learning outcomes that a student on such a scheme may be expected to attain if they take full advantage of the opportunities for learning provided by the scheme.

1. Awarding Institution: University of Wales
2. Teaching Institution: Cardiff University and University of Wales College of Medicine
3. Final Award: MSc in Orthopaedic Engineering
4. Programme/Scheme: Orthopaedic Engineering
5. Relevant QAA benchmark: Engineering

6. Programme (Scheme) Aims

General Aims
- To provide a distance learning package for Orthopaedic Surgeons who wish to develop their career at postgraduate level.
- To provide a scheme of study for Orthopaedic Surgeons which explores aspects of engineering relating to medicine and examines practical problems arising out of implant technology.
- To introduce basic features of engineering principles (in relation to materials, experimentation, mechanical engineering theory and surgical practice) which are relevant to the Orthopaedic discipline.
- To provide the opportunity for research in particular areas of interest relating to the application of engineering to Orthopaedics.

Educational Aims
- To introduce the principles of mechanics to biomechanics encountered within orthopaedics.
- To familiarise students with experimental and research techniques which are applicable to the medical field.
- To provide a scientific basis for rational analysis of common surgical techniques and an understanding of the mechanisms of injuries and the biology of bone and soft tissue.
- To promote an understanding of the materials used in orthopaedics and their properties.

Developmental Aims
- To provide continued professional development to practising orthopaedic surgeons.

7. Programme (Scheme) Outcomes

Students who gain the award will have demonstrated achievement of the following Learning Outcomes, as set out under A, B, C, D, below.

A Knowledge and understanding

Intended Outcomes: Upon completion of the scheme, a typical student will be expected to be able to:
- demonstrate an understanding of general engineering applied to the orthopaedic field;
- to understand the multidisciplinary nature of medical engineering and the need for integration of knowledge from a range of engineering disciplines;
- to select an appropriate mathematical/statistical method and apply it to a particular problem;
• to demonstrate a broad knowledge and understanding of a range of statistical methods applied to orthopaedics;
• to demonstrate an understanding of engineering materials and their application to the practice of orthopaedics;
• to apply solutions to orthopaedic problems using engineering analysis and techniques.

B Intellectual skills

Intended Outcomes: Upon completion of the scheme, a typical student will be expected to be able to:
• use knowledge and scientific evidence based methods in assessing and solving practical orthopaedic problems.
• to critically review the literature/data/clinical evidence in orthopaedics and formulate a possible solution.
• to originate and develop a research project in orthopaedic engineering involving the application of generalised engineering principles to a clinical problem.
• to identify main issues in orthopaedics and to provide both in writing and through presentations a reasoned approach to these issues.
• to critically assess the introduction of new implants and materials in the field of orthopaedic medicine.

C Practical skills

Intended Outcomes: Upon completion of the scheme, a typical student will be expected to be able to:
• to use appropriate engineering and mathematical knowledge and skills to solve orthopaedic related problems.
• to be able to quickly assess and formulate a solution to specific problems encountered in an operating theatre on a day to day basis.

D Transferable skills

Intended Outcomes: Upon completion of the scheme, a typical student will be expected to be able to:
• to apply engineering techniques to the field of orthopaedics;
• to interpret, analyse and present data for peer review;
• to use engineering knowledge to assist in the development of new orthopaedic devices and techniques.

8. Scheme structure and requirements, courses and awards

The scheme is presented as a two year part-time, guided distance learning masters level program with residential week-ends. Detailed structures and requirements, courses and awards are available in the Student Handbook.

The program is presented in two stages:
Part 1 (over two years) consists of six modules worth 120 credits.
Part 2 consists of a Project worth 60 credits.

Assessment is undertaken at the end of each stage.

Additional Information


Methods for evaluating and improving the quality and standards of learning include:
Annual Review of Scheme (report made public in the School);
Periodic Review;
Academic Validation of Schemes of Study;
External Examiners Reports (made annually);
Student Module Evaluations (each student makes an anonymous evaluation on each of his/her modules, and results are made public in the School);
Student/Staff Sub-groups (with minutes made public in the School);
Student Representatives on Sub-Board of Studies;
Staff Appraisal;
Staff Peer Review of Teaching.