Specialist Diploma in Medical Device Science

Overview

Duration: 1 year
Schedule: Part-time
Starting: September 2011
Fees: €1,900
Closing Date: Friday 15 July 2011

- Curriculum focused on the strong and growing medical devices sector
- Delivery via blended learning teaching methodologies
- Medium-term up-skilling for career advancement or specialisation and/or re-skilling for career change or cross-team roles

Entry Requirements

Applicants must be in receipt of the Diploma in Science & Technology Studies or a related Diploma or higher qualification. Applicants may use experience in addition to academic qualifications to demonstrate that they satisfy the course prerequisites.

What Type of Course is it?

This one-year, part-time Diploma programme aims to develop specialist knowledge of the medical devices sector and to develop relevant technical and soft skills.

The programme is delivered by blended learning, participants receive learning materials in both online and in hard copy format for each module. Materials are specifically designed for independent study and will be supplemented by supporting online learning resources where appropriate. The programme requires attendance on campus for approximately 10 hours per module, or one Saturday every month between September and May. Between campus visits you will interact with tutors and peers via an online learning system.

How Will I Benefit?

This course will be of particular benefit to people who require medium-term up-skilling for career advancement within the medical devices sector, or for those looking for focused re-skilling with a view to a career change. If will be of benefit to those with a biology background to gain an appreciation of the technology and engineering aspects of the sector, and equally engineers will benefit from exposure to the science behind the devices.

On completion of the course will have highly marketable, up-to-date and confidence-building knowledge and skills relevant to the medical devices sector. They will have practiced and been assessed on a range of technical and transferable skills which will be beneficial at both the personal and enterprise levels.

If graduates so wish they can progress to the B.Sc. in Science & Technology Studies (NQF level 8) with credit for their studies. In this case they will be exempt from one elective stream in the Degree cycle.

Learning Objectives

On completion of the course participants should have:

- a holistic appreciation of the science and engineering behind various medical devices
- specialised knowledge of human anatomy, physiology and biochemistry and disease states which can be monitored or improved by the use of medical devices
- technical knowledge of the chemistry and physics of materials and an appreciation of which materials can be used to best effect in medical devices
- technical knowledge and skills in the design, development and manufacture of medical devices
- an appreciation of best practice, industry standards, policies and regulations within the medical devices sector

Curriculum

This Specialist Diploma consists of four inter-related taught modules and a project, each worth 6 ECTS, giving a total of 30 ECTS.

The four taught modules are:

- Mechanics of Solids
- Human Anatomy & Physiology
- Biocompatibility & Device Design
- Medical Device Science

The module contents are presented at the end of this document.

The project topic is chosen by you in consultation with your supervisor.

Assessment

Assessment of the taught modules is through continuous assignments and written examinations and in some cases practical laboratory sessions. Exams take place at the end of each semester. The project is assessed through staged delivery of a project report. The award mark is based on an average result of all five modules.

Course Structure

The course is offered over one academic year (September to May) on a part-time basis. Two taught modules are complete each semester (September to December and January to May) while the project is completed over the academic year.

Fees

The fees for the course are €1,900 for E.U students and €2,400 for non-E.U students. This fee includes;

- Registration
- Tuition fees
- Course materials
- Examinations and assessments

How Do I Apply?

Applications should preferably be made online at: www.nuigalway.ie/apply
Alternatively an application form can be downloaded at www.modularbsc.ie
The closing date for receipt of applications is **Friday 15th July 2011**.

Contact

Further information is available from:
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Module Contents

BST117 Anatomy & Human Physiology

Unit 1	The Human Body
Unit 2	The Integumentary System
Unit 3	The Skeletal System
Unit 4	The Muscular System
Unit 5	The Nervous System
Unit 6	The Endocrine System
Unit 7	The Cardiovascular System
Unit 8	The Haematological System
Unit 9	The Lymphatic System
Unit 10	The Respiratory System
Unit 11	The Digestive System
Unit 12	The Urinary System
Unit 13	The Reproductive System
Unit 14	Pregnancy
Unit 15	The Senses
Unit 16	The Brain

BST118 Biocompatibility & Device Design

Unit 1	Biomaterials and Medical Devices
Unit 2	Classes of Biomaterials
Unit 3	Tissue Engineering
Unit 4	Device Design
Unit 5	Biomaterials Processing
Unit 6	Device Fabrication
Unit 7	Device Characterisation - Surface Properties
Unit 8	Device Characterisation – Bulk Properties
Unit 9	Device Characterisation – In Vitro Studies / Biological
Unit 10	Device Characterisation – In Vivo Studies
Unit 11	Devices Degradation & Failure
Unit 12	Inflammation
Unit 13	Wound Healing
Unit 14	Infection
Unit 15	Future Directions
Unit 16	Clinical Trials

BST119 Mechanics of Solids

Unit 1	Introduction to Mechanics Of Solids
Unit 2	Stress and Strain, Design 1
Unit 3	Stress and Strain, Design 2
Unit 4	Axially Loaded Member 1
Unit 5	Axially Loaded Member 2
Unit 6	Torsion 1
Unit 7	Torsion 2
Unit 8	Shear Force and Bending Moment 1
Unit 9	Shear Force and Bending Moment 1
Unit 10	Shear Force and Bending Moment 2
Unit 11	Stresses in Beams 1
Unit 12	Stresses in Beams 2
Unit 13	Stresses in Beams 3
Unit 14	Analysis of Stresses and Strains 1
Unit 15	Analysis of Stresses and Strains 2
Unit 16	Analysis of Stresses and Strains 3

BST120 Medical Device Science

Unit 1	Evolution of Medical Devices through Technology
Unit 2	Medical Device Industry in Ireland
Unit 3	Types of Medical Devices
Unit 4	General Requirements for Medical Devices
Unit 5	Material Used In Medicine I: Metals and Ceramics
Unit 6	Materials Used In Medicine II: Polymers and Composites
Unit 7	Strengths of Devices
Unit 8	Mechanical Failure of Medical Devices
Unit 9	Cardiovascular Devices I
Unit 10	Cardiovascular Devices II
Unit 11	Cardiovascular Devices III
Unit 12	Joint Replacement I
Unit 13	Joint Replacement II
Unit 14	Fracture Fixation I
Unit 15	Fracture Fixation II
Unit 16	Patents