

Programme of study for the integrated degree of PhD and MSc (Tissue Engineering and Regenerative Medicine – Innovation in Medical & Biological Engineering)¹ 2023/24

Entry Requirements: *This programme is no longer recruiting*

Year One (a total of 120 credits in taught modular courses will be taken as well as the research project)

- The candidate will commence research under the direction of their supervisor(s) from term 3.
- Compulsory training and skills module:
MECH5005M Training and professional development activities (15 credits)
- Compulsory specialised subject modules:
LUBS5247M Managing for innovation (15 credits)
MECH5002M Cross disciplinary laboratory placement (15 credits)
MECH5007M Systematic review (15 credits)
MECH5009M Research project proposal (5 credits)
MECH5565M Medical engineering experimental design and analysis (15 credits)
- Candidates are required to select 40 credits from the following optional modules with a maximum of 30 credits below level M in Year 1:

CAPE5710M Biomaterials and Applications (15 credits)
CAPE5750M Materials Structures and Characterisation (15 credits)
CAPE5770M Nanomaterials (15 credits)
DSUR5072M Stem Cell Therapy and Tissue Engineering (10 credits)
MECH3225 Biomedical Engineering Design (20 credits)
MECH5221M Spinal Biomechanics and Instrumentation (distance learning) (15 credits)
MECH5270M Basic Orthopaedic Engineering (15 credits)²
MECH5315M Engineering Computational Methods (15 credits)
MECH5410M Surface Engineering (15 credits)
MECH5490M Biomaterials (short course) (15 credits)
MECH5500M Functional Joint Replacement Technology (short course) (15 credits)
MECH5570M Introduction to Tribology (15 credits)
MECH5650M Biotribology (15 credits)
MICR1201 Introduction to Microbiology (10 credits)
MICR1220 Introduction to Immunology (10 credits)
MICR5100M Tissue Engineering (15 credits)

PGRs will be required to pass at least 100 taught credits in order to progress on the programme.

Year Two (a total of 60 credits in taught modular courses will be taken as well as the research project)

- The candidate will continue research under the direction of their supervisor(s)
- Compulsory training and skills module:
MECH5006M Training and professional development activities 2 (15 credits)
- Compulsory specialised subject modules:
MECH5003M Industrial Research Project (15 credits)
LUBS5980M Innovation Management in Practice (15 credits)
- Candidates are required to study 15 credits from the following optional modules with a maximum of 30 credits below level M across the two years of study:
• CAPE5710M Biomaterials and Applications (15 credits)

¹ To be read in conjunction with the general Programme of Study for the Integrated degrees of PhD and Master (MA, LL.M or MSc)

² Is only for PGRs from a non-engineering / physical sciences background.

INTEGRATED DEGREE OF PHD AND MSC (TISSUE ENGINEERING AND REGENERATIVE MEDICINE – INNOVATION IN MEDICAL AND BIOLOGICAL ENGINEERING)

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- CAPE5770M Nanomaterials (15 credits)
- DSUR5072M Stem Cell Therapy and Tissue Engineering (10 credits)
- MECH3225 Biomedical Engineering Design (20 credits)
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- MECH5500M Functional Joint Replacement Technology (short course) (15 credits)
- MECH5570M Introduction to Tribology (15 credits)
- MECH5650M Biotribology (15 credits)
- MICR1201 Introduction to Microbiology (10 credits)
- MICR1220 Introduction to Immunology (10 credits)
- MICR5100M Tissue Engineering (15 credits)

PGRs will be required to pass at least 150 taught credits and successfully transfer to full PhD status in order to progress on the programme.

Years Three and Four

- The candidate will continue research under the direction of their supervisor(s)

Learning Outcomes / Transferable Key Skills / Learning Context / Assessment – overall programme integrated degree of PhD and MSc (Tissue Engineering and Regenerative Medicine – Innovation in Medical & Biological Engineering)

1. Learning Outcomes

On completion of the programme PGRs should have shown evidence of being able:

- to demonstrate in-depth, specialist knowledge and mastery of techniques relevant to medical technologies in the interdisciplinary theme of Tissue Engineering and Regenerative Medicine and/or to demonstrate a sophisticated understanding of concepts, information and techniques at the forefront of the discipline;
- to exhibit a wide breadth of knowledge and mastery of generic and subject-specific intellectual abilities and specific industry/clinical related skills such as the use of modelling software, data collection, aspects of legislation, innovation and ethics;
- to demonstrate a comprehensive understanding of techniques applicable to their own research or advanced scholarship in the field of Tissue Engineering and Regenerative Medicine;
- to take a proactive and self-reflective role in working and to develop professional relationships with others;
- proactively to formulate ideas and hypotheses and to develop, implement and execute plans by which to evaluate these;
- critically and creatively to evaluate current issues, research and advanced scholarship in the discipline.
- undertake a research project and be able to plan, research, execute and analyse the results from an appropriate programme of work.

2. Transferable (Key) Skills

Masters (Taught), Postgraduate Diploma & Postgraduate Certificate PGRs will have had the opportunity to acquire the following abilities as defined in the modules specified for the programme:

- the skills necessary to undertake a higher research degree and/or for employment in a higher capacity in industry or area of professional practice;
 - evaluating their own achievement and that of others;
 - self direction and effective decision making in complex and unpredictable situations;
 - independent learning and the ability to work in a way which ensures continuing professional development;
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3. Learning Context

For Masters (Taught) PGRs the learning context will include the analysis of, and decision making in, complex and unpredictable situations. The structure of the programme will provide breadth and/or depth of study and opportunities for drawing upon appropriate resources and techniques. Opportunities will be provided for PGRs to develop:

- interests and informed opinions;
- their involvement in the design and management of their learning activities;
- their communication of their conclusions;
- PGRs will be expected to progress to fully autonomous study and work.

4. Assessment

Achievement for the degree of Master (taught programme) will be assessed by a variety of methods in accordance with the learning outcomes of the modules specified for the year/programme and will involve the achievement of the PGRs in:

- evidencing an ability to conduct independent in-depth enquiry within the discipline;
- demonstrating the ability to apply breadth and/or depth of knowledge to a complex specialist area;
- drawing on a range of perspectives on an area of study;
- evaluating and criticising received opinion;
- make reasoned judgements whilst understanding the limitations on judgements made in the absence of complete data.