

# INTEGRATED DEGREE OF PHD AND MSC (MEDICAL AND BIOLOGICAL ENGINEERING)

## Programme of study for the Integrated degree of PhD and MSc (Medical and Biological Engineering)<sup>1</sup>

Entry to this programme has been suspended with effect from 2014 -2015

**Year One** (a total of 115 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) either from term 1 or term 2.
- Compulsory training and skills modules:  
MECH5005M Training and Professional Development Activities 1 (15 credits)

- Candidates undertake a number of non-credit bearing generic skills courses from a range provided by for example central training providers (SDDU, ISS, Library), the Faculty or outside bodies.

- Compulsory (100 credits) specialised subject modules as follows:

MECH5007M Systematic Review (15 credits)

MECH5008M Cross-Disciplinary Laboratory Placements (20 credits)

MECH5009M Research Project Proposals (5 credits)

MEDP5321M Research Methods (15 credits)

Specialised subject modules (45 credits<sup>2</sup>) will be chosen from an approved list of optional modules which are listed in the PGR Course Handbook.

**Year Two** (a total of 65 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 (30 credits) specialised subject modules as follows:
- MECH5003M Industrial Research Project (15 credits<sup>2</sup>)
- MECH5006M Training and Professional Development Activities 2 (15 credits)
- Further non-credit bearing training courses to be taken as appropriate.

Specialised subject modules (35 credits) will be chosen from an approved list of optional modules which are listed in the PGR Course Handbook.

Candidates will be permitted to proceed to assessment for transfer to full PhD status if they achieve an average of 50% over all 180 credits of which 150 credits must be passed at 50% or more in each and every module undertaken, and of these 135 credits must be at M Level.

## Years Three and Four

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

Optional and compulsory non-credit bearing training and skills modules selected as appropriate from the wide-range of training courses provided at the University of Leeds (e.g. Writing for Research PGRs in the Sciences, Thesis Presentation).

Changes may be made from time to time to the titles of modular courses and the optional modular courses that are available

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<sup>1</sup> Entry to this programme has been suspended with effect from 2014 -2015. See also the general Programme of Study for the Integrated degrees of PhD and Master (MA, LLM or MSc) which specifies the overall arrangements for the University Integrated PhD and Masters programme

<sup>2</sup> Other approved modules may be added to the list of optional modules from time to time

**Learning Outcomes / Transferable Key Skills / Learning Context / Assessment**

**1. Learning Outcomes**

On completion of the Integrated PhD with MSc as a whole, PGRs should have shown evidence of being able to:

- discover, interpret and communicate new knowledge through original research in the field of medical and biological engineering and produce scholarship of publishable quality which satisfies peer review;
- independently and proactively formulate ideas and hypotheses and to design, develop, implement and execute plans by which to evaluate these;
- demonstrate systematic and extensive knowledge across the three broad interdisciplinary themes of Joint replacements and cartilage substitution; Spinal biomechanics and interventions; and Tissue engineering;
- critically and creatively evaluate current issues, research and advanced scholarship in the above themes;
- demonstrate systematic knowledge of and be able to critically assess, analyse and engage with the ethical and legal context of their research and any ethical and legal implications of their research.
- exhibit generic and subject specific skills and techniques necessary for effective working in an interdisciplinary research-intensive environment, in liaison with academic and industrial partners, ensuring widening participation through engagement in public events, enterprise and knowledge transfer;
- demonstrate a portfolio of transferable professional skills through the use of Personal Development Plans including, for example, communication and presentation skills, ethics, networking and team development, commercial awareness; to take a proactive and self-reflective role in working and to develop professional relationships with others where appropriate;
- undertake an individual research project in the area of Medical and Biological Engineering, incorporating research in a specific area, but also including reference to the wider context of industrial and clinical development; to present and defend research outcomes which extend the forefront of the Medical and Biological Engineering discipline;
- demonstrate the skills necessary for a career as a researcher and/or for employment in a senior and leading capacity in a relevant area of professional practice or industry;
- evaluate their own achievement and that of others;
- exhibit self-direction and effective decision making in complex and unpredictable situations;
- demonstrate independent learning and the ability to work in a way which ensures continuing professional development;

**2. Transferable (Key) Skills**

PGRs will have had the opportunity to acquire the following abilities through the research training and research specified for the programme

- the skills necessary for a career as a researcher and/or for employment in a senior and leading capacity in a relevant area of professional/clinical practice or industry;
- 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;

**3. Learning Context**

The learning context will include the critical analysis of, and decision making in, complex and unpredictable professional and/or clinical situations. The structure of the programme will provide research and/or professional training, breadth and depth of study and opportunities for drawing upon appropriate resources and techniques. Opportunities will be provided for PGRs to:

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- develop to a high level interests and informed opinions
- develop to a high level their design and management of their learning activities
- develop to a high level their communication of their conclusions;
- make an original contribution to the field

PGRs will be expected to engage in the exercise of autonomous initiative in their study and work in professional environments.

### **4. Assessment**

Achievement will be assessed by the examination of the candidate's thesis and performance under oral examination. Assessment will involve the achievement of the candidate in: evidencing an ability to conduct original and independent broad and in-depth enquiry within the discipline or within different aspects of the area of professional/clinical practice normally leading to published work;

- drawing on and/or developing a range of research techniques and methodologies appropriate to enquiries into the discipline/area of professional practice;
- demonstrating independent critical ability in the application of breadth and depth of knowledge to complex issues within the discipline or specialist area of professional/clinical practice;
- drawing on a range of perspectives on the area of study;
- evaluating and criticising received opinion;
- making reasoned and well-informed judgements on complex issues within the specialism whilst understanding the limitations on judgements made in the absence of complete data
- the written style and overall presentation of the thesis.