

## **Programme of study for Doctor of Philosophy – Integrated Tribology**

### **Taught Components Year 1**

**Year One** (a total of 105 credits, of which a minimum of 90 credits must be level M, in taught modular courses will be taken)

- Compulsory training and skills module:

MEC6907 Tribology Masterclass (University of Sheffield)  
MECH5004 Training and Professional Development Activities (30 credits)

- Compulsory group project:  
MECH5585 Mini project - group (30 credits)

- Compulsory individual project:  
MECH5575 Mini project – individual (30 credits)

- Candidates are required to select one optional module from both lists A & B

#### List A

MECH5570M Introduction to Tribology (15 credits)  
MECH5660M Lubrication and Lubricants (15 credits)  
MECH5510M Computational & Experimental Methods (15 credits)  
MECH5021M Oilfield Chemistry and Corrosion (15 credits)

#### List B

MECH5410M Surface Engineering (15 credits)  
MECH5195M Automotive Driveline (15 credits)

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

Other optional modules may be selected, subject to consideration and approval of the Programme Manager. Candidates are advised to discuss this with their supervisors.

PGRs who do not complete the above taught requirements will not be able to proceed to the degree of PhD, but may be eligible instead for the award of Postgraduate Diploma in Integrated Tribology.

PGRs will be required to pass at least 90 taught credits in order to progress on the programme.

### **Research Component Year 1**

PGRs will begin their main PhD research in year one. In order to progress PGRs must satisfy the CDT Academic Progression Committee by demonstrating aptitude for doctoral level research, along with the taught components of the programme.

### **Examinations**

PGRs will be notified of their host examinations timetables when appropriate.

### **Year 2**

PGRs must submit their transfer report by no later than 18 months from the start of the candidature. PGRs will be required to successfully transfer to full PhD status by no later than Month 24 of the candidature in order to progress on the programme.

### **Years Three and Four**

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

### **Impact Project**

From Month 30 of the candidature, PGRs will carry out a six month impact project where they apply research in an industrial environment. PGRs undertaking industrial one-to-one projects will spend this placement with their industrial sponsor, whereas PGRs completing pre-competitive research will choose from a list of industrial placement offers. The industrial impact projects will be defined in a facilitated workshop, with PGRs present as key participants.

## **Learning Outcomes / Transferable Key Skills / Learning Context /Assessment for PhD**

### **1. Learning Outcomes**

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

- to discover, interpret and communicate new knowledge through original research and/or scholarship of publishable quality which satisfies peer review;
- to present and defend original research outcomes which extend the forefront of a discipline or relevant area of professional/clinical practice;
- to demonstrate systematic and extensive knowledge of the subject area and expertise in generic and subject/professional skills;
- to take a proactive and self-reflective role in working and to develop professional relationships with others where appropriate;
- to independently and proactively formulate ideas and hypotheses and to design, develop, implement and execute plans by which to evaluate these;
- to critically and creatively evaluate current issues, research and advanced scholarship in the discipline;
- to 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.

### **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**

This 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:

- 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;

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- 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