Postgraduate Programme Specification

Future Propulsion and Power PhD

Academic Year 2023/24

Awarding body	Loughborough University
Programme title	Future Propulsion and Power
Primary award	Doctor of Philosophy (PhD) or Master of Philosophy (MPhil)
Mode of Study	Full-time and Part-time
Programme length	Full-time: 3 years (with a maximum submission time of 4 years) Part-time: 6 years (with a maximum submission time of 7 years) Note: the PhD is part of the CDT in Future Propulsion and Power, a prerequisite of undertaking the 3 years at Loughborough is completion of the 1-year MRes run by Cambridge as part of the CDT programme).
Owning school/department	School of Aeronautical, Automotive, Chemical and Materials Engineering
Campus	Loughborough
Admissions criteria	https://www.lboro.ac.uk/study/postgraduate/research-degrees/
Date at which the programme specification was published	

Accreditation

None

Programme Aims

This programme aims to:

- produce research and design leaders of the future, in academia and industry, in the field of future propulsion and power technologies with particular reference to gas turbine aerodynamics;
- equip students with the skills to design and carry out a research project, resulting in a thesis which will provide a contribution to knowledge and contain original work worthy of publication;
- equip students with specialised technical understanding of the aerothermal performance of future propulsion and power technologies and knowledge of the experimental and computational tools used in their design;
- expose students to the compromises and trade-offs that are inherent in the design of a real machine, including the limitations imposed by mechanical constraints, the interactions between components when they are integrated together to form the complete product, and the challenges of system-level optimisation;
- expose students to the requirements of future propulsion and power systems, such as: integrated propulsor-airframe concepts; hybrid-electric propulsion; compact and flexible operation power generation.
- provide training to enable engineers to derive learning from the ever-increasing supply of data (from experimental tests, from computations and from real engines in the field) and hence develop improved concepts and technologies;
- foster the development of non-technical research skills such as leadership, personal effectiveness, report writing, oral communication and presentations; and

Copyright © Loughborough University. All rights reserved.

- expose students to different research groups and industry environments.

Benchmarks

Relevant subject benchmark statements and other external and internal reference points used to inform programme outcomes:
The Frameworks for Higher Education Qualifications of UK Degrees
Doctoral Degree Characteristics Statement (QAA)
Credit Level Descriptors for Higher Education (SEEC)
Loughborough University Quality Reviews
Research Council Annual Reviews

Learning Outcomes

Knowledge and Understanding

On completion of the PhD studies, students should:

- have a thorough knowledge of the literature and a comprehensive understanding of scientific methods and techniques applicable to future propulsion and power systems and their own research;
- be able to demonstrate originality in the application of knowledge, together with a practical understanding of how research and enquiry are used to create and interpret knowledge in their field;
- have developed the ability to critically evaluate current research and research techniques and methodologies;
- have self-direction and originality in tackling and solving problems;
- have knowledge of and be able to apply appropriate experimental and computational methods used in their field;
- be able to act autonomously in the planning and implementation of research; and
- have the ability to report research outcomes in an appropriate way for the intended audience; and
- have developed skills for preparing reports (of different types), delivering presentations, writing technical papers worthy of publication, verbal communication and research planning and delivery.

Skills and other attributes

Subject-specific cognitive skills:

See above

Subject-specific practical skills:

See above

Key transferable skills:

See above

University Regulations

University Regulations for Postgraduate Research study are set out in Regulation XXVI (Higher Degrees by Research).

Please see the Terms and Conditions of Study for detailed information on your contract with the University.

Programme structure

This PhD is a component of the EPSRC Centre for Doctoral Training in Future Propulsion and Power in collaboration with the Universities of Oxford and Loughborough. The CDT has a 1 + 3-year structure with the 1st year comprising of a 1-year MRes degree run by Cambridge. To proceed onto the PhD phase students will have to pass the MRes and thereby demonstrate adequate research potential.

Part R1

Doctoral Researchers will complete the following:

Full-time Doctoral Researchers are normally expected to complete 10 days per annum of professional development training, with part-time Doctoral Researchers completing a suitable equivalent.

Submission of a 1000-word research report at 6 months for part-time Doctoral Researchers.

Submission of a 2,000-word research report at the mid-way point of Part R1 and submission of a satisfactory 10,000-word research report (end of Part report) towards the end of Part R1 in accordance with the provisions of Regulation XXVI.

Typically, the timetable for reports in R1 will follow the schedule below.

Time spent in R1	6 months	12 months	24 months
Full-time	2,000-word mid-part report	10,000-word end of part report	
Part-time	1,000-word research report	2,000-word mid-part report	10,000-word end of part report

Part R2

Doctoral Researchers will complete the following:

Full-time Doctoral Researchers are normally expected to complete 10 days per annum of professional development training, with part-time Doctoral Researchers completing a suitable equivalent.

PhD candidates: Submission of a mid-part review for part time Doctoral Researchers, and a satisfactory 10,000-word research report (end of Part report) towards the end of Part R2 in accordance with the provisions of Regulation XXVI.

Typically, the timetable for reports in R2 will follow the schedule below.

Time spent in R2	12 months	24 months
Full-time	10,000-word end of part report	
Part-time	Mid-part report	10,000-word end of part report

MPhil candidates: Submission of their formal MPhil thesis for examination in accordance with the provisions of Regulation XXVI at the end of part R2.

Part R3

Doctoral Researchers will complete the following:

Full-time Doctoral Researchers are normally expected to complete 10 days per annum of professional development training, with part-time Doctoral Researchers completing a suitable equivalent.

Submission of a mid-part report for part time Doctoral Researchers.

At the end of R3, submission of a formal PhD thesis for examination in accordance with the provisions of Regulation XXVI. Typically, the timetable for reports in R3 will follow the schedule below.

Time spent in R3	12 months	24 months

Copyright © Loughborough University. All rights reserved.

Full-time	PhD submission	
Part-time	Mid-part report	PhD submission

Criteria for Progression and Degree Award

To progress from Part R1 to Part R2 and from Part R2 to Part R3, and to be eligible for an award, candidates must satisfy the assessment requirements set out in Regulation XXVI. Candidates must complete all the requirements for each Part outlined above in order to progress to the next Part. If an end of part report does not meet the standards required for progression, candidates may undertake further work and resubmit the report on one occasion only in accordance with the provisions of Regulation XXVI.