

## Programme Specification

1. Programme Title: PhD by Thesis in Chemistry
2. Awarding Institution: University of Reading
3. Programme Status: Existing programme
4. Programme Length:

Full-time		Part-time		
Expected	Maximum	Minimum	Expected	Maximum
3 years	4 years	4 years	5 years	6 years

Full-time students are able to submit their thesis after the first day of the 9<sup>th</sup> term; part-time students are able to submit their thesis after the first day of the 12<sup>th</sup> term. The Dean of Postgraduate Research (PGR) Studies can approve requests for earlier submission where a case merits this.

### 5. Entry Requirements

**Academic:** Applicants should normally possess at least a first degree (normally of an upper second class honours standard or above), or equivalent.

The Dean of PGR Studies can approve the admission of students with lower or non-standard qualifications.

**Language:** Applicants whose first language is not English should normally have attained a score of at least 6.5, with 5.5 on each of the four subsections, on the IELTS (International English Language Testing System), or equivalent, test.

Again, the Dean of PGR Studies can approve the admission of students with a lower mark if there is other evidence of appropriate English language proficiency.

**APEL:** Where previous experience in research is deemed satisfactory by the Dean of PGR Studies, the prescribed period of study may be reduced to two academic years for applicants for full-time PhD study and three academic years for applicants to part-time PhD study.

## 6. Learning Outcomes<sup>1</sup>

By completion of the PhD, students should be able to demonstrate:

- That they are competent as an independent researcher in their discipline and capable of continuing to undertake research at an advanced level, contributing substantially to the development of new Ideas, techniques or approaches. As part of this, they should have gained;
  - An ability to evaluate critically the existing literature relevant to their thesis topic
  - An ability to conceptualise, design and implement a project for the generation of significant new knowledge and / or understanding
  - An ability to relate theory and concepts to evidence in a systematic way and to draw appropriate conclusions based on evidence
- An understanding of the place of the student's research in the context of the relevant field of study
- Awareness of the research integrity and relevant ethical and professional considerations
- Effective management of a project, from identifying research questions, planning interim milestones and timescale, prioritising activities, managing research resources, through to timely completion
- An appreciation of the impact (interpreted in the broadest sense) of their research and how to exploit this
- They should also be able to demonstrate that they can
  - Write clearly and in a style appropriate to the purpose and audience
  - Construct coherent arguments and articulate and defend ideas clearly to a range of audiences, through a variety of techniques
  - Develop and maintain working relationships and co-operative networks with supervisors, colleagues, peers and the wider research community
  - Demonstrate self-awareness and the ability to identify own training needs, in relation to their current position and future career development

In addition, many students will have attained additional skills relating to areas such as teaching, mentoring, public engagement, exploitation and commercialisation of research, and leadership.

## 7. Programme outline

The programme will comprise:

- An independent research project that makes an original contribution to knowledge, written up in the form of a thesis
- Research training
  - Discipline Specific skills:

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<sup>1</sup> This adheres to level 8 of the FHEQ as required by the QAA

Students are required to attend one 10 credit module. Further information is provided in Annex A, together with assessment requirements.

Students are also required to attend Health & Safety training. Attendance at the Laboratory Health & Safety and COSHH Risk Assessments for new postgraduate students is mandatory. Depending on the nature of the research project, attendance at other training courses may be required (e.g. laser training, liquid nitrogen handling, etc.)

At the start of their programme, students attend a Databases for Chemists and Endnote training session.

- Generic / transferable skills:

At the start of their programme, students will complete a Learning Needs Assessment to determine what further training would be beneficial to their studies and ongoing career development. This has to be reviewed by the supervisor/s and approved by the School / Department Director of PGR Studies

Students are normally required to take at least five courses from the Reading Researcher Development Programme (RRDP) in year 1, and at least three courses in years 2 and 3 (or part-time equivalent). The Preparing to Teach programme can substitute for one of these.

School / Department Directors of PGR Studies can alter these requirements in cases where students have taken equivalent courses in their Schools or elsewhere, or have appropriate professional experience.

- Other training:

Students wishing to use instruments (e.g. NMR, TGA, DSC, TEM, SEM, etc) located in the Chemical Analysis Facility (CAF) are required to take the appropriate training. Students may wish, or be required, to take additional training from within the University, such as that provided by the International Study and Language Centre.

## 8. Progression

- Students will be subject to an annual review of progress, the details of which are summarised in the Code of Practice on Research Students<sup>2</sup>
- Towards the end of year 1 (or equivalent for part-time students), the review will take the form of a Confirmation of Registration assessment. The four possible outcomes of this assessment are:
  - Confirmation of PhD status at first attempt
  - Deferral of the decision, with an agreed plan of remedial action, and an opportunity to be re-assessed at an agreed time (normally with 3 months of the original interview). This is the expected outcome if Confirmation is not agreed at first attempt.
  - Transfer of registration to MPhil
  - Invocation of procedures for Academic Engagement & Fitness to Study

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<sup>2</sup> Available at [http://www.reading.ac.uk/web/FILES/qualitysupport/cop\\_resstudents.pdf](http://www.reading.ac.uk/web/FILES/qualitysupport/cop_resstudents.pdf)

## 9. Additional requirements

Students should normally make at least two oral presentations of their work, to an appropriate audience within the School or Department, during the course of their programme. Year 3 (or equivalent PT) students are required to present (and defend) their research at the annual Chemistry Research Day. Year 2 (or equivalent PT) students are required to present and defend a poster outlining their research at the same event.

In addition, attendance at the Department of Chemistry Research Colloquia is compulsory for all PhD students throughout the course of their programme.

## 10. Final Assessment

Students are required to submit a thesis, the length of which should not normally be greater than 90,000 words. The format of this is specified in the Rules for Submission of Theses for Higher Degrees<sup>3</sup>. Any divergence from these rules must be approved by the Dean of PGR Studies before the student submits.

Assessment of the thesis normally takes the form of a *viva voce* examination, conducted by two independent examiners. Further details of the procedure can be found in the Guide for Examiners of Higher Degrees by Research<sup>4</sup>.

### *Criteria for the award of the degree*

- The work presented by the candidate is such that it might reasonably be expected as a result of three years full-time postgraduate work;
- The abstract of the thesis is acceptable as it is, or with some modification
- The candidate understands how his or her thesis topic is related to a wider field of knowledge
- The candidate can demonstrate;
  - the creation and interpretation of new knowledge, through original research or other advanced scholarship, of a quality to satisfy peer review, to extend the forefront of their discipline, and to merit publication in an appropriate form
  - a systematic acquisition and understanding of a substantial body of knowledge which is at the forefront of the discipline or area of professional practice
  - the general ability to conceptualise, design and implement a project for the generation of new knowledge, applications or understanding at the forefront of the

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<sup>3</sup> Available at <http://www.reading.ac.uk/graduateschool/currentstudents/gs-pgexaminations.aspx>

<sup>4</sup> Available at <http://www.reading.ac.uk/graduateschool/currentstudents/gs-pgexaminations.aspx>

- discipline, and the ability to adjust the project design in the light of unforeseen problems
- a comprehensive understanding of techniques applicable to their own research or advanced scholarship.

#### 11. Research Environment and Facilities

Schools and Departments are responsible for providing students with information about the availability of, and access to, relevant research facilities, as well as information about relevant School / Department based events.

The University Graduate School provides additional space and facilities for PhD students<sup>5</sup>.

#### 12. Student Support and Guidance

In addition to that provided by the supervisor/s, School / Department Director of PGR Studies, and other School staff, students can draw on support and advice relating to the progress and management and their research programme from the PGR School Support Team and the Doctoral Research Office, both based within the Graduate School.

Sources of additional support and advice within the University are listed on the Graduate School website<sup>6</sup>.

#### 13. Student representation

- Each School / Department will ensure that appropriate procedures are in place for the election of a postgraduate research student representative, each year.
- School / Department representatives attend termly meetings in the Graduate School to bring forward any matters of concern and to comment on matters raised by Graduate School staff.
- One or more postgraduate research students will also be a member of the appropriate board or committee where postgraduate research matters are discussed within the School / Department.

#### 14. Student feedback

Students are expected to complete a questionnaire on their supervisory arrangements on an annual basis. This is carried out via a standard University form, which is emailed to all students. Completed

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<sup>5</sup> Available at <http://www.reading.ac.uk/graduateschool>

<sup>6</sup> Available at <http://www.reading.ac.uk/graduateschool/currentstudents/gs-university-services.aspx>

forms need to be returned to the Graduate School<sup>5</sup>. A process is in place for following up any issues raised by students. Further details are given in the Code of Practice process<sup>2</sup>.

Where Schools and Departments run subject specific training courses, they will have arrangements in place for students to provide feedback on these.

Students are asked to complete a feedback questionnaire on each RRDP course attended. Students can also feedback on any aspect of the RRDP directly to the Graduate School<sup>7</sup>, or through their School / Department Director of PGR Studies, or their School / Department PGR Representative.

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<sup>7</sup> Email [gradschool@reading.ac.uk](mailto:gradschool@reading.ac.uk)

## **Annex A: Taught course requirements**

Students will select 10 credits worth of modules or equivalent at the H or M level from the Department of Chemistry, or validated courses from other Schools within the University, that are most appropriate to their research area. Further details of modules from other Schools within the University as well as those within the Department of Chemistry, can be found at <http://www.reading.ac.uk/module/module.aspx?sacyr=1819&school=CFP>. Examples of modules available are:

**CH3AN1 X-ray Techniques and Databases in Analytical Chemistry (10 credits)**

**CH3AN2 Advanced Analytical Techniques for Inorganic Structure Determination (10 credits)**

**CH3I1 d and f Block Chemistry (10 credits)**

**CH3I2 Clusters, Extended Arrays and Solid-State Chemistry (10 credits)**

**CH3O1 Advanced Organic Chemistry – Synthesis of Complex Targets (10 credits)**

**CH3O2 Advanced Organic Chemistry – Contemporary Synthetic Methodology (10 credits)**

**CH3P1 Advanced Topics in Physical Chemistry 1 (10 credits)**

**CH3P2 Advanced Topics in Physical Chemistry 2 (10 credits)**

**CH4AN1 Advanced Analytical Techniques for the Molecular Sciences (10 credits)**

**CH4CR Current Topics in Chemical Research (10 credits)**

**CH4I2 Catalysis (10 credits)**

**CH4O1 Advanced Organic Chemistry – Synthesis of Complex Targets (2) (10 credits)**

**CH4O4 Oligosaccharides and Natural Products (10 credits)**

**CH4PC Polymer Chemistry (10 credits)**

**CH4I3 Functional Inorganic Materials (10 credits)**

**CH4P4 Polymer & Biophysical Chemistry (10 credits)**

**CH4P3 Advanced Techniques in Physical Chemistry (10 credits)**

**CH4SK Chemistry in Industry and Professional Skills (10 credits)**

**Modules from other Schools can also be included by agreement with the other Schools**