# Programme Specification (Postgraduate)

**FOR ENTRY YEAR: 2022/23**

**Date created:** 09/12/2020 **Last amended:** 14/12/21 **Version no.** 1

## 1. Programme title(s) and code(s)

MSc Chemistry

**Exit Award:**

PG Certificate Chemistry

**HECOS Code**

| HECOS Code | % |
|---|---|
| 100417 | 100 |

## 2. Awarding body or institution

University of Leicester

## 3. a) Mode of study

Full-time

### b) Type of study

Campus-based

## 4. Registration periods

The normal period of registration for the MSc Chemistry is 12 months

The maximum period of registration for the MSc Chemistry is 24 months

## 5. Typical entry requirements

A minimum of BSc (Lower Second Class Honours) in Chemistry or a related subject or equivalent;

Students required to demonstrate English proficiency in line with the requirements of Senate Regulations 1.

## 6. Accreditation of Prior Learning

N/A

## 7. Programme aims

The programme aims to:

- Develop and build upon the knowledge and understanding obtained through undergraduate degree programmes.
- Equip students with the knowledge and skills to be able to carry out chemistry research and to serve as a link for graduates who wish to prepare for entry to a PhD programme, or compete for employment as practicing chemists in a research environment.
- To reinforce and extend students' basic chemistry knowledge.
- To enhance students' practical skills.

- To teach students to plan a series of experiments to achieve specific objectives.
- To stimulate intellectual development, develop powers of critical analysis and ability to solve problems.
- To encourage students to reflect on their own strengths and weaknesses, and to provide them with opportunities to enhance transferable skills, particularly written and oral communication skills, IT and information handling, retrieval and manipulation skills, including databases and on-line resources.
- To equip students with the knowledge and generic skills for carrying out original research.
- To train students in chemical research methodology through planning and carrying out an extended research project.

## 8. Reference points used to inform the programme specification

- QAA Master's Degree Characteristics (2015)
- QAA Benchmarking Statement UK Quality Code for Higher Education
- University Learning Strategy
- University Assessment Strategy
- University of Leicester Periodic Developmental Review Report
- External Examiners' reports (annual)
- United Nations Education for Sustainable Development Goals
- Student Destinations Data

## 9. Programme Outcomes

Unless otherwise stated, programme outcomes apply to all awards specified in 1. Programme title(s).

### a) Discipline specific knowledge and competencies

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| Memorization and understanding of relevant chemistry theory including either synthesis or characterisation methods in organic chemistry or condensed and gas phase physical chemistry. | Lectures, independent work (group), specified reading, workshops. | Written exams, Marked assignments |
| Advanced knowledge of specialist areas of chemistry research and innovation. | Theory module lectures, independent work (group), specified reading, and workshops. | Written exams, Marked assignments |

ii) Concepts

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| Enhanced grasp of the principles of synthesis, characterization and physical chemistry. | Lectures, laboratory training, independent work (group), specified reading, workshops. | Written exams, Marked assignments |
| An ability to apply chemical concepts in new situations e.g. ability to predict physical and chemical properties by comparison with analogues | Lectures, laboratory training, independent work (group), specified reading, workshops. | Written exams, Marked assignments |

iii) Techniques

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| Practical demonstration of experimental method. | Supervised laboratory work | Laboratory samples, associated data, lab-notebooks and reports. |
| Professional use of standard equipment, knowledge of safety procedures. | Supervised laboratory work | Laboratory samples, associated data, lab-notebooks and reports. |
| Mastery of research | Research Project | Research project outline, dissertation |

iv) Critical analysis

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| Critical analysis of chemical information and summarise key findings of scientific papers. Abstract writing. | Supervised laboratory work<br>Group work<br>Reading primary research literature, research project | Laboratory notebooks and reports<br>Group presentations<br>Extended essay; dissertation |

v) Presentation

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| Presentation of chemical information in appropriate formats | Instruction on use of appropriate software<br>Group work<br>Project supervision<br>Contributing member at research group teaching sessions | Laboratory notebooks<br>Project reports<br>Group presentations<br>Project presentation |

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| Distinguish between relevant and irrelevant material depending on the context e.g. for an oral presentation or for a written report | Instruction on use of appropriate software<br>Group work<br>Project supervision<br>Contributing member at research group teaching sessions | Project reports<br>Group presentations<br>Project presentation |
| Participation in scientific discussion. | Instruction on use of appropriate software<br>Group work<br>Project supervision<br>Contributing member at research group teaching sessions | Group presentations |
| Give presentations and present posters | Instruction on use of appropriate software<br>Group work<br>Project supervision<br>Contributing member at research group teaching sessions | Group presentations<br>Project presentation |

vi) Appraisal of evidence

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| Understand scientific reasoning and hence plan an investigation using appropriate methods | Supervised group mini-projects.<br>Workshop/group exercises<br>Project supervision | Laboratory samples, associated data, lab notebooks and reports.<br>Research outline<br>Assessed work (oral and written presentation)<br>Dissertation |
| Be able to evaluate different sources of information | Supervised group mini-projects.<br>Workshop/group exercises<br>Project supervision | Laboratory samples, associated data, lab notebooks and reports.<br>Research outline<br>Assessed work (oral and written presentation)<br>Dissertation |
| Recognise that more than one solution may be possible to a problem and may depend on the data available | Supervised group mini-projects.<br>Workshop/group exercises<br>Project supervision | Laboratory samples, associated data, lab notebooks and reports.<br>Research outline<br>Assessed work (oral and written presentation)<br>Dissertation |

**b) Transferable skills**

i) Research skills

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| On successful completion of the programme students will be able to: | Workshops (problem solving)<br>Laboratory data analysis<br>Use of online databases<br>Contributing member at research group teaching sessions<br>Project supervision | Written exams, coursework<br>Library exercises<br>Essay writing<br>Project reports<br>Laboratory assessment<br>Dissertation |

ii) Communication skills

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| Response to questioning | Workshops | Oral assessment (vivas) |
| Ability to deliver an oral presentation using appropriate visual aids | Lecture advice from project supervisor use of PowerPoint | Oral presentations for modules and projects |
| Laboratory notebook | Contributing member at research group teaching sessions | Assessed lab-notebook |
| Report writing, conforming to standard chemical conventions. | Writing workshops | Project reports, Dissertation |

iii) Data presentation

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| Ability to present chemical information clearly and effectively in appropriate format | Research methods lectures and exercises, use of Chemical Software, e.g. drawing or molecular modelling | Lab reports, assessed problems, project reports, oral presentations. Dissertation (MSc) |

iv) Information technology

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| Use of spreadsheets, word processing, presentation software, data management, project specific (chemical) software | Laboratory data analysis.<br>Group working.<br>Project supervision (MSc) | Lab reports, assessed problems, project reports, oral presentations.<br>Dissertation (MSc) |

v) Problem solving

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| Ability to solve chemical problems. | Lectures, laboratory data analysis, group work.<br>Research project | Written exams, coursework.<br>Library exercises.<br>Group assessments/reports. |

vi) Working relationships

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| Knowing how and when to draw on the knowledge & expertise of others | Group problem solving<br>Negotiating duties for group tasks.<br>Working in shared research laboratories | Group assessment (outcomes and peer assessment) |
| Recognition of strengths and weaknesses of self and others, using this to promote group learning. | Group problem solving<br>Negotiating duties for group tasks.<br>Working in shared research laboratories | Group assessment (outcomes and peer assessment) |

vii) Managing learning

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| Ability to manage, reflect on and develop own learning | Done via progress files. | Progress file will be discussed with tutor |
| Time management | Lab–work and projects | Meeting deadlines, project assessment |

viii) Career management

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| Ability to prepare a CV | Lecture | CV assessment |

| Intended Learning Outcomes | Teaching and Learning Methods | How Demonstrated? |
|---|---|---|
| Knowledge of how to find and apply for research positions | Lecture, Careers event | Meeting with course tutor |

## 10. Special features

CH7361 will integrate some elements of the undergraduate CH3271 Advanced Chemistry Practical modules but will also include some bespoke teaching and assessment elements to ensure it is aligned with the appropriate level 7 outcomes.

All theory modules will be co-taught with the identical MChem Level 4 modules indicated in parenthesis.

Students will be supported in choosing theory modules such that their chosen combination is (1) tailored to their interests/needs and; (2) will complement the research theme under which they wish to conduct their research project. In advance of Semester 1 students will be provided with an information pack to help inform their choice. This will contain module descriptions, a summary of active research within the School of Chemistry's four research themes, and indicative module combinations that best compliment those themes (see table below). Prior to registration, students will be asked to submit their preliminary module choices and desired research project theme to the Programme Director. This will enable the School to ensure students make appropriate choices and will assist with forward planning. Subsequently, all students will be offered a consultancy meeting with the MSc Programme Director to discuss their options and help arrive at the best module choices for them. In a situation where unorthodox module choices are proposed, the Programme Director will actively seek to discuss these with the student.

## 11. Indicators of programme quality

Quality management will be overseen by the School of Chemistry Teaching and Learning Committee.

Also; External Examiners' reports; Departmental review; Student feedback; completion metrics

## 12. Criteria for award and classification

This programme follows the standard scheme of taught postgraduate award and classification set out in Senate Regulations – see the version of *Senate Regulation 6 governing taught postgraduate programmes of study* relevant to year of entry.

## 13. Progression points

As defined in Senate Regulations - refer to the version of *Senate Regulation 6 governing taught postgraduate programmes of study* relevant to year of entry.

The following additional progression requirements for this programme have been approved:

- Progression Board 1 (February): CH7360 (15, skills) and CH7361 (30, practical) are assessed in Semester 1. Any student failing to meet the progression criteria will be invited to resit assessments for CH7360 (coursework-based). There is no reassessment option for CH7361. Students who do not meet progression criteria following reassessment will be withdrawn from their research project and considered at an extraordinary Board. The extraordinary Board will recommend termination of their course in the following scenarios:

    i. Fail a single module, CH7360 or CH7361, at Grade F.
    ii. Fail CH7360 and CH7361 at Grade D.

- Progression Board 2 (June): The board will consider the theory elements (45) which are assessed in the Semester 2 Exam period, and any CH7360 reassessments
  Because in most circumstances no more than 45 credits are under consideration, any student with failed credits will continue their research projects and be invited to resit assessments.

- Award Board (September): The Board will apply the Award Classifications as set out in Senate Regulation 6 to determine the outcome of individual awards (MSc or PG Cert)

- Additional Board (ad hoc): An additional Award Board will be organised to consider students who are granted extensions to their research projects due to mitigating circumstances.

In cases where a student has failed to meet a requirement to progress he or she will be required to withdraw from the course and a recommendation will be made to the Board of Examiners for an intermediate/exit award where appropriate.

**14. Rules relating to re-sits or re-submissions**

As defined in Senate Regulations - refer to the version of *Senate Regulation 6 governing taught postgraduate programmes of study* relevant to year of entry.

**15. External Examiners reports**

The details of the External Examiner(s) for this programme and the most recent External Examiners' reports for this programme can be found at exampapers@Leicester [log-in required]

**16. Additional features** (e.g. timetable for admissions)

N/A

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# Programme Specification (Postgraduate) **FOR ENTRY YEAR:** Choose an item.

**Date created:** Click or tap here to enter text. **Last amended:** 14/12/21. **Version no.** Choose an item.

**Appendix 1: Programme structure (programme regulations)**

The University regularly reviews its programmes and modules to ensure that they reflect the current status of the discipline and offer the best learning experience to students. On occasion, it may be necessary to alter particular aspects of a course or module.

MSc Chemistry

**Updates to the programme**

| Academic year affected | Module Code(s) | Update |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

**Credit breakdown**

| Status | Year long | Semester 1 | Semester 2 | Other delivery period |
|---|---|---|---|---|
| Core taught | n/a | 45 credits | n/a | n/a |
| Optional | 45 credits | n/a | n/a | n/a |
| Dissertation/project | n/a | n/a | 90 credits | n/a |

180 credits in total

**Level 7/Year 1** **2022/23**

Core modules

| Delivery period | Code | Title | Credits |
|---|---|---|---|

| | | | |
|---|---|---|---|
| Semester 1 | CH7360 | Advanced Research and Communication Skills | 15 |
| Semester 1 | CH7361 | Advanced Practical Techniques and Skills | 30 |
| Semester 2 | CH7362 | MSc Research Project | 90 |

Option modules

| Delivery period | Code | Title | Credits |
|---|---|---|---|
| Year Long | CH7301 | Advanced Structure Determination | 15 |
| Year Long | CH7302 | Advanced Synthetic Methods | 15 |
| Year Long | CH7303 | Earth System Science | 15 |
| Year Long | CH7308 | Bioinorganic Chemistry | 15 |
| Year Long | CH7307 | Computational Chemistry and Quantum Mechanics | 15 |
| Year Long | CH7311 | Medicinal Chemistry | 15 |

**Notes**

- CH7361 will use semester 1 elements of the CH3271 Advanced Chemistry Practical module, with two additional weeks of upfront skills training.
- All theory modules will be co-taught with the identical MChem Level 4 modules indicated in parenthesis.
- Students will be supported in choosing theory modules such that their chosen combination is (1) tailored to their interests/needs and; (2) will complement the research theme under which they wish to conduct their research project. In advance of Semester 1 students will be provided with an information pack to help inform their choice. This will contain module descriptions, a summary of active research within the School of Chemistry's four research themes, and indicative module combinations that best compliment those themes (see table below). Prior to registration, students will be asked to submit their preliminary module choices and desired research project theme to the Programme Director. This will enable the School to ensure students make appropriate choices and will assist with forward planning. Subsequently, all students will be offered a consultancy meeting with the MSc Programme Director to discuss their options and help arrive at the best module choices for them. In a situation where unorthodox module choices are proposed, the Programme Director will actively seek to discuss these with the student. Indicative module combinations for each research theme:

| Project Research Theme | Recommended Module Options |
|---|---|
| Chemical Biology | CH7301, CH7302, CH7308, CH7311 |
| Synthesis and Catalysis | CH7301, CH7302, CH7311 |
| Spectroscopy and Dynamics | CH7301, CH7303, CH7307 |
| Atmospheric Chemistry | CH7301, CH7303, CH7307 |

This is an indicative list of option modules and not definitive of what will be available. Option module choice is also subject to availability, timetabling, student number restrictions and, where appropriate, students having taken appropriate pre-requisite modules.

**Appendix 2: Module specifications**

See taught postgraduate module specification database (Note - modules are organized by year of delivery).