

## PROGRAMME SPECIFICATION

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### Master of Chemistry in Applied Chemistry

<b>Awarding institution</b>	Liverpool John Moores University
<b>Teaching institution</b>	LJMU
<b>UCAS Code</b>	F1F5
<b>JACS Code</b>	F110
<b>Programme Duration</b>	Full-Time: 4 Years
<b>Language of Programme</b>	All LJMU programmes are delivered and assessed in English
<b>Subject benchmark statement</b>	Chemistry
<b>Programme accredited by</b>	
<b>Description of accreditation</b>	
<b>Validated target and alternative exit awards</b>	Master of Chemistry in Applied Chemistry Bachelor of Science with Honours in Applied Chemistry Diploma of Higher Education in Applied Chemistry Certificate of Higher Education in Applied Chemistry
<b>Programme Leader</b>	Steve Enoch

### Educational aims of the programme

To provide, for all students, a defined academic programme with clear learning outcomes.

To provide students with a comprehensive understanding and skills of chemistry at an advanced level required to equip them for a career in research, the chemical, allied and other industries and professions.

To develop critical, analytical problem-based learning skills, initiative and independent thinking and transferable skills to prepare the student for graduate employment.

To permit students to acquire a high level of vocationally-orientated practical, analytical and research skills in chemistry.

To encourage students to make significant academic and practical contribution to the discipline of applied chemistry.

To develop those learning, information technology, communication and reflective skills necessary to enable students to undertake advanced independent study, to participate in lifelong learning, and to maintain a broad knowledge of 21st century chemistry.

To furnish the students with hands-on operational experience of up-to-date, chemical industry-specify apparatus relevant to synthetic and analytical areas.

#### Alternative Exit/ Interim Award Learning Outcomes - Certificate of Higher Education

*A student who is eligible for this award will be able to:*

Reflect on the scientific skills required for the course and their future careers.

Develop a basic, practical and relevant mathematical and chemical foundation for the quantitative aspects of all Level 4 modules.

Apply the skills needed for academic study and enquiry.

Utilise problem-solving skills to applied chemical science.

Collect, analyse, and interpret experimental data.

Evaluate his/her own academic and professional performance.

Take responsibility for personal and professional learning and development.

Understand the career opportunities and challenges ahead.

### **Alternative Exit/ Interim Award Learning Outcomes - Diploma of Higher Education**

*A student who is eligible for this award will be able to:*

Reflect on the scientific skills required for the course and their future careers.

Possess a detailed knowledge and understanding of the chemical properties and reactions which are relevant to the modern chemical industry.

Apply the skills needed for academic study and enquiry.

Critically appraise laboratory methods and the design of chemical laboratory experiments, their implementation and interpretation of their results.

Utilise problem-solving skills to applied chemical science.

Plan and execute safely laboratory experiments with an awareness of good laboratory practice (GLP) and COSHH assessment.

Collect, analyse, and interpret experimental data.

Evaluate his/her own academic and professional performance.

Take responsibility for personal and professional learning and development.

Understand career opportunities and challenges ahead.

### **Alternative Exit/ Interim Award Learning Outcomes - Bachelor of Science with Honours**

*A student who is eligible for this award will be able to:*

Be aware of the organic, inorganic, analytical and polymer chemistry relating to the laboratory and plant preparation of chemicals and materials relevant to the modern Chemical and allied industries.

Express knowledge and understanding of the philosophy and procedures used in the discovery, development, commercial production and application of modern materials.

Implement the skills needed for academic study and enquiry.

Employ planning, research methodologies and analytical skills to an in-depth study of a topic in a chosen field of Applied Chemistry.

Implement problem-solving skills to applied chemical science.

Confidently plan and execute safely laboratory experiments with an awareness of good laboratory practice (GLP) and COSHH assessment.

Formulate evaluative judgements on the technical outcomes relating to industrial Chemistry, and report the findings accordingly.

Evaluate his/her own academic and professional performance.

Communicate effectively and confidently by discussion, written materials, use of image and graphical representations.

Apply the scientific skills acquired on the course and their future careers

## **Target award Learning Outcomes - Master of Chemistry**

*A student successfully completing the programme of study will have acquired the following subject knowledge and understanding as well as skills and other attributes.*

*A student who is eligible for this award will be able to:*

1. Evaluate, utilise and present essential facts, concepts, principles and theories of chemistry.
2. Analyse, critically appraise, report and explain chemical information and data.
3. Distinguish and critically discuss significant areas of current research and development in the area of applied chemistry.
4. Recognise and apply scientific principles in various fields of applied chemistry.
5. Critically evaluate current research in applied chemistry.
6. Formulate hypotheses relating to current research in applied chemistry.
7. Apply the skills needed for academic study and enquiry to an advanced level.

8. Adapt and apply knowledge and understanding of chemistry to the solution of unfamiliar qualitative and quantitative problems.
9. Evaluate, summarise and report research laboratory and published data and relate them to underlying theory.
10. Critically consider, design and construct laboratory work, up to the level of advanced projects.
11. Demonstrate self-direction, initiative and originality in the use of chemical knowledge and methodologies applied to the study of advanced topics.
12. Demonstrate self-direction and initiative in the planning and safe execution of laboratory work, in line with good laboratory practice (GLP) and COSHH assessment.
13. Collect, analyse, and interpret complex experimental data.
14. Demonstrate critical consideration of and make evaluative judgements on technical matters at the forefront of applied chemistry, and report the findings accordingly.
15. Communicate effectively in multi-skilled teams, establishing professional and ethical relationships
16. Appreciate the requirement for responsible and ethical behaviour in the chemical and allied industries, with particular reference to the environment.
17. Communicate effectively with a wide range of individuals via discussion, written materials, use of images and presentations (oral and poster).
18. Self -evaluate academic and professional performance.
19. Utilise problem-solving skills, qualitative and quantitative, in a variety of theoretical and practical situations, including evaluation on the basis of limited information.
20. Demonstrate a wide range of study, IT, numerical and computational skills.
21. Manage time, prioritise workloads and recognise and manage personal emotions and stress.
22. Understand continuing professional development, identifying career opportunities and challenges ahead.

## Teaching, Learning and Assessment

*The methods used to enable outcomes to be achieved and demonstrated are as follows:*

Teaching, learning and assessment methods used to enable outcomes to be achieved and demonstrated  
Lectures, practicals, tutor-led tutorials, student and tutor-led seminars, problem-based learning scenarios, and self-directed study.

Testing of the knowledge base is through a combination of unseen written examinations and assessed coursework in the form of laboratory experiment write-ups, essays, and coursework reports.

Lectures, practicals, seminars, tutorials, and case studies.

Written examinations, practical reports, coursework, evidence-based portfolio submissions, oral presentations.

Lectures, practicals, seminars, data handling workshops, and problem-based learning.

Laboratory reports, case study reports, and evidence-based portfolio submission.

Transferable/key skills are embedded in the modules of the programme. Examples include the use of spreadsheets and statistical computer packages to analyse data, the use of presentation packages to produce seminars and posters, group working, and the production of a transferable/key skills portfolio.

Oral presentations (individual and group), poster presentations, portfolio, and laboratory reports.

## Programme structure - programme rules and modules

### Study Abroad

Students will be offered the opportunity of study abroad at Level 5. Students can choose either Option A or Option B.

Option A: replacement of 60 credits of Level 5 with appropriate study abroad

The programme will offer the opportunity of 60 credits of study abroad at Level 5. Students will be enrolled on a 480 credit MChem with study abroad programme. A 60 credit Level 5 study abroad module [5009APCHEM Study Semester Abroad - Chemistry] will normally replace the semester 2 modules on the standard programme. This study abroad should cover the same learning outcomes as the modules being replaced. The modules to be studied in the host institution must be agreed in advance. The Level 5 mean for the final award mark will be calculated based upon the 120 credits at Level 5.

Option B: additional study year abroad following Level 5

The programme will offer the opportunity of an additional study year abroad following Level 5. Students will be enrolled on a 600 credit MChem with study abroad programme. Of those 600 credits, 120 will be taken via a Level 5 study abroad module [5008APCHEM Study Year Abroad - Applied Chemistry]. The modules to be studied in the host institution must be agreed in advance. The Level 5 mean for the final award mark will be calculated based upon the 240 credits at Level 5.

Level 7	Potential Awards on completion	Master of Chemistry
Core	Option	Award Requirements
7000APCHEM RESEARCH PROJECT (60 credits) 7001APCHEM ADVANCED ANALYSIS (20 credits) 7002APCHEM HI-TECH COLOURANTS (20 credits)	7003APCHEM PREDICTIVE TOXICOLOGY (20 credits) 7004APCHEM ADVANCED ORGANIC SYNTHESIS (20 credits)	100 core credits at level 7 20 option credits at level 7
Level 6	Potential Awards on completion	
Core	Option	Award Requirements
6002APCHEM INDUSTRIAL ANALYSIS (20 credits) 6003APCHEM PRACTICAL LABORATORIES 5 (20 credits) 6004APCHEM MODERN SYNTHESIS (20 credits) 6005APCHEM MOLECULAR DESIGN (20 credits) 6006APCHEM PRACTICAL LABORATORIES 6 (20 credits) 6007APCHEM CHEMISTRY MINI-PROJECT (20 credits)		120 core credits at level 6 0 option credits at level 6
Level 5	Potential Awards on completion	
Core	Option	Award Requirements
5001APCHEM RADIATION AND MATTER (20 credits) 5002APCHEM UNDERSTANDING MOLECULES (20 credits) 5003APCHEM PRACTICAL LABORATORIES 3 (20 credits) 5004APCHEM UNDERSTANDING MATERIALS AND MIXTURES (20 credits) 5005APCHEM STRUCTURE AND ANALYSIS (20 credits) 5006APCHEM PRACTICAL LABORATORIES 4 (20 credits)		120 core credits at level 5 0 option credits at level 5
Level 4	Potential Awards on completion	
Core	Option	Award Requirements
4001APCHEM ATOMIC STRUCTURE AND REACTIVITY (20 credits) 4002APCHEM FROM ATOMS TO MOLECULES (20 credits) 4003APCHEM PRACTICAL LABORATORIES 1 (20 credits) 4004APCHEM PROPERTIES OF MOLECULES (20 credits) 4005APCHEM PROPERTIES OF MATTER (20 credits) 4006APCHEM PRACTICAL LABORATORIES 2 (20 credits)		120 core credits at level 4 0 option credits at level 4

## Information about assessment regulations

All programmes leading to LJMU awards operate within the University's Academic Framework.  
<https://www.ljmu.ac.uk/about-us/public-information/academic-quality-and-regulations/academic-framework>

## Opportunities for work-related learning ( location and nature of activities)

All students will have an opportunity to engage with the University's employability programme CareerSmart as an integral part of a core module of study. Work-related learning opportunities are available through the routes of employer seminars and guest lectures / workshops. The School has a good record of providing relevant vocational training for students. Students are supported by the Erasmus and Professional Training Tutors who are responsible for advertising placements and promoting vocational training to students. Those students wishing to undergo a year's experience in industry will be expected to register this with the Professional Placements Tutor (PPT) early in Level 5, and will then be allowed to compete for such positions which become available during that academic year. Conversely, the student may wish to arrange a placement individually, although any such placement must be approved by the PPT. Placements are expected to run for 12 months.

## Criteria for admission

### A/AS Level

Applicants should have (or expect to obtain) at least 3 A2 Levels or equivalent, one of which should be in chemistry. Our minimum points tariff is 280 points. Our offers may be grade specific e.g. we usually expect at least a grade B in chemistry.

### BTEC National Diploma

Applicants should be studying an appropriate Diploma and have (or expect to obtain) a pass with at least 3 merit grades at Level 3 in appropriate units.

### Irish Leaving Certificate

Applicants must have passed (or expect to pass) their Irish Higher exams with at least grade BBC in 3 subjects, 2 of which must be sciences (Psychology may be considered a science).

### Scottish Higher

Applicants must have passed (or expect to pass) their exams with at least grade BBC in 3 subjects, 2 of which must be sciences (Psychology may be considered a science).

### International Baccalaureate

Applicants must have (or expect to obtain) the full award including grade 5 in one appropriate science.

### Access

Access applicants should have (or expect to obtain) a pass in an appropriate QAA-approved Access course.

### Higher national diploma

Second year entry can potentially be arranged for candidates who have a HND or HNC with merits in the key relevant units or for those who have passed the first year of a degree programme in a closely related subject elsewhere.

### Other

In common with standard University policy, applicants should have GCSE passes in Mathematics and English Language at grade C or above, or equivalent.

### Mature entry

We welcome applications from highly motivated mature applicants with relevant experience but without the necessary formal qualifications. To qualify as a mature student you have to be at least 21 years of age by the 31st December of the year of entry.

### Overseas qualifications

Applicants should have acquired passes in appropriate examinations in their country of origin and provide Programme: evidence of English language ability equivalent to 6.0 IELTS.

## External Quality Benchmarks

All programmes leading to LJMU awards have been designed and approved in accordance with the UK Quality Code for Higher Education, including the Framework for Higher Education Qualifications in the UK (FHEQ) and subject benchmark statements where applicable.

The University is subject to periodic review of its quality and standards by the Quality Assurance Agency (QAA) Published review reports are available on the QAA website at [www.qaa.ac.uk](http://www.qaa.ac.uk)

Programmes which are professionally accredited are reviewed by professional, statutory and regulatory bodies

(PSRBs) and such programmes must meet the competencies/standards of those PSRBs.

## Support for students and their learning

The University aims to provide students with access to appropriate and timely information, support and guidance to ensure that they are able to benefit fully from their time at LJMU. All students are assigned a Personal Tutor to provide academic support and when necessary signpost students to the appropriate University support services.

Students are able to access a range of professional services including:

- Advice on practical aspects of study and how to use these opportunities to support and enhance their personal and academic development. This includes support for placements and careers guidance.
- Student Advice and Wellbeing Services provide students with advice, support and information, particularly in the areas of: student funding and financial matters, disability, advice and support to international students, study support, accommodation, health, wellbeing and counselling.
- Students studying for an LJMU award at a partner organisation will have access to local support services

## Methods for evaluating and improving the quality and standards of teaching and learning

### Student Feedback and Evaluation

The University uses the results of student feedback from internal and external student surveys (such as module evaluations, the NSS and PTES), module evaluation questionnaires and meetings with student representatives to improve the quality of programmes.

### Staff development

The quality of teaching is assured through staff review and staff development in learning, teaching and assessment.

### Internal Review

All programmes are reviewed annually and periodically, informed by a range of data and feedback, to ensure quality and standards of programmes and to make improvements to programmes.

### External Examining

External examiners are appointed to programmes to assess whether:

- the University is maintaining the threshold academic standards set for awards in accordance with the FHEQ and applicable subject benchmark statements
- the assessment process measures student achievement rigorously and fairly against the intended outcomes of the programme(s) and is conducted in line with University policies and regulations
- the academic standards are comparable with those in other UK higher education institutions of which external examiners have experience
- the achievement of students are comparable with those in other UK higher education institutions of which the external examiners have experience

and to provide informative comment and recommendations on:

- good practice and innovation relating to learning, teaching and assessment observed by external examiners
- opportunities to enhance the quality of the learning opportunities provided to students

### **Please note:**

*This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, content, teaching, learning and assessment methods of each module can be found in module and programme guides.*