



Programme Specification

Title of Course: *MSc Analytical Chemistry*

Date first produced	30/09/2012
Date last revised	11/08/2023
Date of implementation of current version	01/09/2023
Version number	9
Faculty	Faculty of Health, Science, Social Care & Education
School	School of Life Sciences, Pharmacy and Chemistry
Department	Department of Chemical & Pharmaceutical Sciences
Delivery Institution	Kingston University

This Programme Specification is designed for prospective students, current students, academic staff and employers. It provides a concise summary of the main features of the programme and the intended learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if they take full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes and content of each modules can be found in the course VLE site and in individual Module Descriptors.

SECTION 1: GENERAL INFORMATION

Award(s) and Title(s): <i>Up to 10 pathways</i>	MSc Analytical Chemistry
Intermediate Awards(s) and Title(s): <i>There are 4 Intermediate awards for each pathway</i>	PGDiploma PGCertificate
Course Code <i>For each pathway and mode of delivery</i>	NPANC
UCAS code <i>For each pathway</i>	N/A

RQF Level for the Final Award:	7
Awarding Institution:	Kingston University
Teaching Institution:	Kingston University
Location:	Penrhyn Road
Language of Delivery:	English
Modes of Delivery:	Part-time With Professional Placement Full Time
Available as:	
Minimum period of registration:	Part-time - 2 With Professional Placement - 1 Full Time - 1
Maximum period of registration:	Part-time - 4 With Professional Placement - 3 Full Time - 2
Entry Requirements:	Candidates with a UK or UK equivalent (stated by NARIC) second class Bachelor Honour's degree in chemistry, pharmacy, pharmaceutical science or a related subject such as pharmacology or biomedical science. are qualified to register for the MSc. Other degrees will be considered on an individual basis. Candidates who do not qualify under the regulations above, but who have appropriate experience are still eligible to apply. A detailed description of appropriate experience and a statement of support from an employer should accompany the application. If these documents are satisfactory, the candidate will normally be

	interviewed (overseas applicants will often be interviewed by telephone/SKYPE)/TEAMS. British nationals/majority English-speaking nation nationals need a GCSE Grade C or above in English or an equivalent qualification, (see webpages for further details). Students who are not a national of a majority English speaking country or who have not completed an academic qualification equivalent to a UK Bachelor's degree in one are required to provide evidence of appropriate competence in use of the English Language, for example by having passed a recognised English Language examination (or equivalent): e.g., British Council IELTS test, (where a minimum overall score of 6.5 and a minimum of 6.0 in Writing, Reading, Listening and Speaking), is required. Normally, exemptions from the study of particular modules will only be granted only on the basis of relevant previous study at master's level (RPL) or relevant experience (RPEL). Students wishing to gain admission to the course with advanced standing will be required to provide certificates, a course/module synopsis, and a portfolio of evidence of their previous learning or work-based experience. Students who have claimed a Diploma in the field will normally be allowed to apply for admission to MSc in the field provided that they do so within a period not normally exceeding 2 years.
Programme Accredited by:	None
QAA Subject Benchmark Statements:	Chemistry March 2022
Approved Variants:	There are no variants to PR.
Is this Higher or Degree Apprenticeship course?	

For Higher or Degree Apprenticeship proposals only

Higher or Degree Apprenticeship standard:	n/a
Recruitment, Selection and Admission process:	n/a
End Point Assessment Organisation(s):	n/a

SECTION 2: THE COURSE

A. Aims of the Course

The aims of the MSc programme are:

- to equip post-graduates with key problem-solving, practical and IT skills in preparation for their careers in a variety of work environments;
- to create a pedagogic environment where a broad range of analytical scientists can enthusiastically pursue their subject in an atmosphere in which teamwork, exchange of ideas and debate are encouraged;
- to provide industrially relevant courses that will enhance the employability of students after graduation
- to equip students with problem-solving, practical, IT and key (transferable) skills derived from the collection, analysis, interpretation and representation of data and information in preparation for their careers in a variety of work environments;
- to give students the independent learning ability required for continuing professional development;
- to offer flexible programmes of study to suit the needs of students in employment and their employers.
- to enable students to study both separation science and atomic and molecular spectroscopy at an advanced level;
- to give students a specialised knowledge of the techniques and applications relating to analytical chemistry.
- to provide the skills required for self-management and autonomy in the planning, organisation and conduct of an independent research project;
- to provide students with opportunities to develop their written and oral communication skills;
- to enable students to identify, locate and critically appraise secondary and primary sources during a research project;
- to offer students the opportunity to express originality and creativity in the quest for new knowledge, the application of current knowledge to new situations or the analysis of knowledge from a novel standpoint.
- to give students a critical awareness of and engagement with current research methods and techniques.

In addition, the aims of the professional placement module are:

- **To provide experience of working in a professional environment that is relevant to the field of study**
- To allow students to consolidate and apply the range of skills and knowledge acquired in the course of their studies to a work environment and to reflect on and develop these skills and knowledge further
- To enhance career prospects through the development of a range of skills that enable students to present themselves effectively, network and make informed decisions about employment and career plans.
- To develop the process of reflection and promote self-awareness in learning
- Give students an opportunity to develop further skills, preparing them for higher levels of employment

B. Intended Learning Outcomes

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, skills and other attributes in the following areas. The programme outcomes are referenced to the QAA subject benchmarks for Chemistry and Pharmacy, and the Framework for Higher Education Qualifications in England, Wales and Northern Ireland (March 2022) and relate to the typical student.

In addition, students who successfully complete the professional placement module will be able to:

- Relate academic theory to practice and apply knowledge and skills in a professional context
- Maintain an accurate account of work activity, reflect critically on the experience of the placement and evaluate their own personal and professional development
- Confidently present a critical understanding of the placement organisation and their experience within it
- Develop and practice key personal and employability skills and be able to show examples of the application of these skills including: self-awareness, communication, interpersonal, research and information literacy, numeracy and management and leadership skills
- Autonomously evaluate tasks set in the work place and apply effective communication and problem solving initiatives to achieve the best outcome for the employer;

The programme learning outcomes are the high-level learning outcomes that will have been achieved by all students receiving this award. They must align to the levels set out in the [‘Sector Recognised Standards in England’](#) (OFS 2022).

Programme Learning Outcomes					
	Knowledge and Understanding		Intellectual Skills		Subject Practical Skills
	On completion of the course students will be able to:		On completion of the course students will be able to		On completion of the course students will be able to
A1	appreciate the role of the analytical chemist in a variety of situations			C1	carry out subject-related practical work safely and understand safety requirements including preparing CoSHH forms
A3	display advanced skills in interpretation and discussion of the results of laboratory data, in the context of the wider analytical problem, and recognise the significance of the results to industry/society in general			C2	select and operate in an efficient manner the techniques used widely in analytical industries
A4	demonstrate an understanding of, and ability to interpret clients' requirements; acquire specialist knowledge of advanced analytical techniques and specialised applications of those techniques			C3	plan and implement good scientific and consistent practice (including contamination avoidance), reliably recording methods and results using appropriate methods to critically analyse the data and evaluate the level of its uncertainty
A5	understand how a research project operates and undertake research in a logical and safe manner			C4	demonstrate skills in the evaluation and interpretation of laboratory data
A6	understand how to prepare a research report and poster in the correct format and to have an active engagement and familiarity with recent and current research methods, results and publications			C5	develop an understanding of the analytical challenges particular to the analytical industry and acquire the specialised knowledge to face those challenges

A2	have an understanding of the principles and theories introduced in the courses and apply that knowledge to familiar and unfamiliar situations			C7	recommend improvements in methodology, technology or interpretation that enhance the performance of processes and/or procedures in an analytical context.
		B7	develop an understanding of the challenges particular to the analytical industries, and with reflection and recall of both theoretical and practical skills, surmount these challenges		
		B6	plan, carry out and report investigations with an effective self-critical attitude		
		B1	approach and resolve the complex problems that can arise during an analysis		
		B2	demonstrate the ability to be independent, autonomous learners		
		B3	achieve competence in the design, planning and execution of practical investigations, selection of appropriate techniques and procedures for carrying out particular chemical analyses		
		B4	assemble data from a variety of sources and discern and establish connections		
		B5	critically analyse and appraise both primary and secondary information sources		
				C6	design controlled experiments to investigate qualitative and/or

					quantitative characteristics of analytical samples and apply and adapt problem solving skills to unfamiliar, complex and open-ended situations

In addition to the programme learning outcomes, the programme of study defined in this programme specification will allow students to develop the following range of Graduate Attributes:

1. Creative Problem Solving
2. Digital Competency
3. Enterprise
4. Questioning Mindset
5. Adaptability
6. Empathy
7. Collaboration
8. Resilience
9. Self-Awareness

C. Outline Programme Structure

The MSc is made up of four taught modules each worth 30 credit points and a research project worth 60 credits (180 credits total). All students will be provided with the University regulations (Postgraduate Credit Framework) and specific additions that are sometimes required for accreditation by outside bodies (e.g. professional or statutory bodies that confer professional accreditation). Full details of each module will be provided in module descriptors and student module guides.

MSc Analytical Chemistry

Level 7							
MSc Analytical Chemistry							
Core modules	Module code	Credit Value	Level	Teaching Block	Pre-requisites	Full Time	Part Time
Molecular and Atomic Spectroscopy	CH7020	30	7	1&2			
MSc Project	CH7100	60	7	3			
Separation Science	CH7030	30	7	1&2			
Specialised Analytical Techniques	CH7040	30	7	1&2			
Statistics and Quality Systems	CH7010	30	7	1&2			
Optional Modules							
Professional Placement	CH7900	120	7	All		1	1

Level 7 information

*The Professional Placement module is for all placements route students and takes place after the project module. It can be up to 1 year in length maximum. Students are expected to engage in 10-12 months of work in the professional environment in a maximum of 2 settings. Assigned hours of work are to be arranged by the supervisor at the host institution. All placements will be arrangements between Kingston University and the institution hosting the placement, which may include companies, research institutes and hospitals. Placements will be assigned to students based on availability and opportunity, taking into consideration the student's background and proficiencies. Selection for placements will often be competitive and at the discretion of the host workplace. Students will demonstrate professional responsibility through attendance at the workplace for the agreed time and hours, adherence to policies in place at the work place, effective professional communication with supervisors and co-workers, and completion of tasks and duties as they are assigned.

*Students starting the course in September will work on the placement for between 10 – 12 months, after their dissertation. Those students must confirm their placement before the deadline which will be notified by the Faculty. Students on courses with January intake will work on the placement for between 10 – 12 months, starting from February, after completing their dissertation. Students on this intake must confirm their placement before the deadline which will be notified by the Faculty. In either case, the suitability of the placement requires approval of the Course Leader. Students on placement must complete a portfolio assessment which includes a reflection on how the theories they have learnt during their teaching year have helped them in their placement and demonstrate ability to apply their teaching in a real world situation.

D. Principles of Teaching, Learning and Assessment

The programme utilises a wide range of teaching and learning methods that will enable all students be actively engaged throughout the course. Knowledge and understanding is developed through teaching and learning methods that are carefully crafted to suit the content and the learning outcomes of the module – typically using lectures in the early parts of modules to ensure that students have the key knowledge relating to the module. Students are then given the opportunity to develop more individual interests and personal and key skills through a variety of group seminar, practical and laboratory sessions.

A range of assessment methods are used to enable students to demonstrate the acquisition of knowledge and skills. Methods include course work, oral presentations, in-class tests, MCQs, examinations, laboratory reports and poster presentations. The assessment regime for each module has been designed to provide formative opportunities that allow students to practice and to receive feed forward on their performance in preparation for the summative assessment. Care has been taken to avoid assessment bunching.

The team make use of technology enhanced learning to improve the student experience and facilitate feedback. Examples include electronic marking and oral feedback via Speedgrader®, online assessments via Canvas and bespoke assignments produced using excel and visual basic to provide rapid marking for problem-solving practicals and electronic feedback in pdf format direct to the students email account.

The School runs a personal tutor scheme for postgraduates giving student the support of their allocated personal tutor, who will help students draw together the themes of the curriculum synoptically by discussing their Personal Development Plan with them. The development of academic skills is threaded throughout the course and assessed both formatively and summatively. Tutors test progress in the development of these skills, but also identify where students may need additional support, which may come via the Academic Skills Centre or other tailored support. A personal development plan system is used to facilitate the process and will involve various touchpoints at different points of the academic year to ensure engagement between tutor and tutee. These will include for example an initial “get to know you” meeting where students will outline their background, describe what they hope to get from the course and how it will fit into their future career plans. A later meeting will look at results/feedback to date, discuss study methods and possible ways to improve performance.

All of the Course team are research active and regularly publish their work in respected journals. This research expertise is directly applied to respective modules, e.g. stability of anti-cancer drugs & -drug testing in sport in the Separation Science module, polymer analysis and thermal analysis in the Specialised Analytical techniques module, and spectral analysis of impurities in the Molecular and Atomic Spectroscopy module. Many hold or have held important positions in the field and regularly attend national meetings e.g. Chair of Register of Analytical Chemists, Chairman of Royal Society of Chemistry South-East Region Analytical Division (SERAD), Hon. Secretary of Royal Society of Chemistry’s (RSC) Analytical Division, RSC Committee for Accreditation and Validation of Courses and most are Fellows or Members of the RSC or Forensic Science Society, Chartered Chemists/EurChem/Chartered Scientists and have professional teaching qualifications e.g. PGCE(HE) CSciTeach, and are Fellows or Senior Fellows of the Higher Education Academy.

E. Support for Students and their Learning

Students are supported by:

- A Module Leader for each module
- A Course Leader to help students understand the programme structure
- Personal Tutors to provide academic and personal support
- Project and professional placement tutors and workplace supervisor to give general advice on placement(s) and visit students
- Technical support to advise students on IT and the use of software
- A designated programme administrator
- An induction week at the beginning of each new academic session. This includes an induction to the University, the School, Library, the Union of Kingston Students, University and School pastoral support and ancillary services
- Student Voice Committee (SVC)
- Canvas – a versatile on-line interactive intranet an learning environment
- A substantial Study Skills Centre that provides academic skills support
- Student support facilities that provide advice on issues such as finance, regulations, legal matters, accommodation, international student support etc.
- Disabled student support

- The Students' Union
- Careers and Employability Service
- Access to LinkedIn Learning which provides video courses taught by industry experts in software, creative, and business skills.

F. Ensuring and Enhancing the Quality of the Course

The University has several methods for evaluating and improving the quality and standards of its provision. These include:

- External examiners
- Boards of study with student representation
- Annual review and development (MRDP- {students comments analysed} and Course summaries)
- Periodic review undertaken at the subject level
- Student evaluation- SSCC, early module evaluation and module evaluation questionnaires
- Moderation policies

In the 2017 Departmental Internal Subject Review of Pharmaceutical Sciences and Chemistry courses, the report evaluated the programmes.

The review team commended the subject team on several strengths in the provision:

- The proactivity and agility of the academic staff that ensure the delivery of, high quality contemporary programmes.
- The quality of the current students and graduates and their engagement with the review team during the meeting.
- The approachability of staff which was particularly raised by students and graduates in both academic and pastoral care.
- The review team noted the following areas of good practice:
- The clear organisational structure for quality assurance and governance offering inclusivity to student representatives.
- The diagnostic student feedback ensures student expectations are managed from the start of the academic year and that provisions can be put in place to meet student expectations. In particular the maths aids, student support and signposting to academic skills provided to undergraduate students were exemplary.
- The wide range of assessments including course work, presentations, exams and essays.
- The mentoring scheme which provides cohort identity and additional support....
- The review team had confidence in the academic standards set and achieved for the fields involved in the review, in terms of the appropriateness of the content and academic level of the learning outcomes of the fields and the consistency of the actual student achievement with the intended outcomes.
- The review team had confidence in the quality of the learning opportunities that supported the students in achieving the academic standards of the awards to which the fields lead.
- The review team concluded that the fields were current and that the aims and learning outcomes were appropriate and were being met. The review team also concluded that the fields were well structured and complied with the Framework for Higher Education Qualifications and relevant subject benchmark statements.

G. Employability and work-based learning

The chemical industry is the UK's largest manufacturing export sector (CIA, Nov 2011) and analytical chemistry / quality control is one of the main employment areas for graduate and postgraduate level scientists. Analytical chemists can find employment either with chemical companies or contract laboratories such as The Laboratory of the Government Chemist (LGC) however there is a large and diverse range of related industries including water quality/environmental analysis, plastics industry, defence industry, food industry, healthcare and consumer products that all employ analytical chemists, . Furthermore the specialism is a major source of employment for scientists in forensics, bioanalysis, clinical analysis, environmental analysis, and materials. They perform a variety of roles including laboratory technical support, laboratory management, forensic investigations (sampling, chemical analysis and data interpretation) and are expected to present evidence through formal reports or directly in court. . The course would also prepare students for a PhD in chemical analysis, instrumentation or related disciplines.

Recent surveys indicate most of our graduates finding employment/further education less than 6 months after graduation in many of the areas mentioned above. Examples of recent graduate employment include Materials Manger at Dubai Cables and Senior Analyst at AWRE, Aldermaston.

Work-based learning, including sandwich courses and higher or degree apprenticeships

Depending on availability, MSc projects may be taken in industry and the professional placement route offers 10-12 months vocational experience in up to 2 settings.

While it is the responsibility of individual students to secure such placements, the Careers and Employability Service offers each student support at all stages of the application process, including writing CVs, completing application forms, participating in mock interviews, assessment centre activities and psychometric tests. The process of applying for a placement gives students the opportunity to experience a real-life, competitive job application process.

The business experience period enables students to apply their learning in the real-world work environment, to reflect upon their own personal experience of working in an applied setting, to focus on aspects of this experience that they can clearly relate to theoretical concepts and to evaluate the relationship between theory and practice. Students will be assessed during and at the end of this period, normally through a portfolio. This will be marked as pass/fail.

Students who undertake work-based placements often benefit greatly from the experience, gaining real experience and work achievements.

H. Other sources of information that you may wish to consult

Royal Society of Chemistry – Analytical Division.

<http://www.rsc.org/Membership/Networking/InterestGroups/Analytical/>

Chemical Industries Association <http://www.cia.org.uk/>

QAA benchmark for Chemistry: http://qaa.ac.uk/docs/qaa/subject-benchmark-statements/sbs-chemistry-14-masters.pdf?sfvrsn=f290f681_16

I. Development of Course Learning Outcomes in Modules

This table maps where course learning outcomes are **summatively** assessed across the modules for this course. It provides an aid to academic staff in understanding how individual modules contribute to the course aims, a means to help students monitor their own learning, personal and professional development as the course progresses and a checklist for quality assurance purposes.

Module Code		Level 7					
		CH7100	CH7040	CH7900	CH7020	CH7030	CH7010
Knowledge & Understanding	A1		S/F				
	A3		S/F				
	A4	S/F	S/F			S/F	
	A5	S/F					
	A6	S					
	A2	F	S/F			F	
Intellectual Skills		F	F		S	F	S
		S/F	S/F			S/F	
		S/F	S/F			S/F	
		S/F	S/F			S/F	
		S/F	S/F			S/F	
		S/F	S/F				
		F	F			F	
	B7	F	S/F				
	B6	S/F					
	B1	S/F	S/F			S/F	
	B2	F				F	
	B3	F				F	
	B4	F				F	
	B5	S/F				S/F	
Practical Skills	C1	S/F	F			F	
	C2	F	F			F	
	C3	S/F	S/F			S/F	
	C4	S/F	S/F			S/F	
	C5	F	F			F	

	C7	S/F				
		F	S/F		F	
		F	F		F	
		F	S/F		F	
		F	F		F	
		S/F				
		S/F	F			
		S/F	F			
	C6	F				
					F	

Students will be provided with formative assessment opportunities throughout the course to practise and develop their proficiency in the range of assessment methods utilised.