

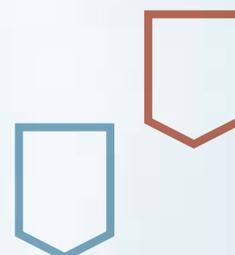
MSc ANALYTICAL SCIENCE FOR INDUSTRY

Postgraduate
Programme

2019 entry



Keele
UNIVERSITY



70
YEARS
of the
KEELE DIFFERENCE



Studying MSc Analytical Science for Industry

Course Features

- Opportunity to discover the industrial world via an industrial placement
- Experience analytical science in the professional context
- Open-door policy with flexible contact hours for excellent access to staff when you need advice or feedback
- Research-driven teaching
- Excellent laboratories facilities
- Develop the skills for your career in analytical science





Welcome to the Analytical Science for Industry programme at Keele!

The MSc Analytical Science for Industry programme at Keele University provides the opportunity for you to acquire post-graduate-level research and employability skills across a broad range of disciplines within Analytical Science in an industrial context, hence providing a strong educational background for a research career in either academia or industry. Chemistry, Forensic Science and Environmental Science amongst other disciplines at Keele conduct internationally recognised fundamental and applied research in many areas in Analytical Science. These range from forensic entomology, proteomics, and FT-IR spectroscopy to materials characterisation and analysis of biochemicals. As a student on the MSc Analytical Science for Industry programme, you will benefit from our expertise in these areas and our collaborative research links with industries that provide the foundation for placement opportunities for our students. Indeed, all students on the MSc Analytical Science for Industry programme will be immersed for 30 weeks in a project with an industrial context, either in Keele University's laboratories or at the industrial partner's premises, which will give them the opportunity to boost their knowledge and ultimately their employability skills.

The MSc Analytical Science for Industry programme is based in the Lennard-Jones (LJ) Laboratories, home to the Chemistry, Forensics Science, Physics and Astrophysics sections of the School of Physical and Geographical Science, where a range of essential resources are provided including modern computer suites, digital imaging services and laboratory facilities. At Keele, we enjoy a friendly and supportive teaching and learning environment that places staff-student interaction at the heart of your learning experience. During the course you will be integrated into the post-graduate working environment of the LJ Laboratories and through working with academic staff and our collaborators, you will gain invaluable experience and establish lasting professional relationships. In addition to the set lectures, project and other classes, you should take advantage of opportunities to attend additional seminars and lectures from invited speakers. These

are a great way to widen your knowledge and to network with experts.

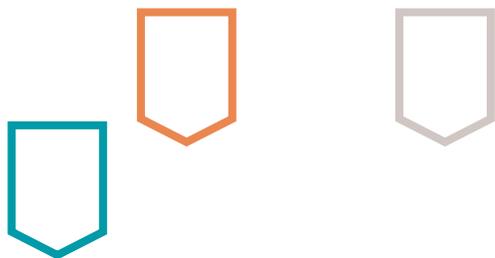
We hope that you will enjoy this course and will relish the challenge of furthering your knowledge both in familiar and unfamiliar areas that will be new and uncharted.

We have produced this brochure to give you information about your course and about the University in general. It will help you understand what we offer, but please ask us if you have any questions or if anything is unclear.

Welcome to Keele!

Chrystelle Egger and the MSc Analytical Science for Industry Programme Team





Main Aims and Distinctiveness of the Programme:

- This one-year (if full-time, otherwise 2yr or 3yr part-time) masters programme aims to provide highly employable graduates who not only have a broad education in analytical sciences but also in the industrial context (commercial awareness and IP matters; science and technology transfer; entrepreneurship), together with a theoretical and practical understanding of the selected analytical techniques used in industry.
- Students on the MSc Analytical Science for Industry programme will benefit from the expertise of staff at Keele in analytical chemistry, analytical biochemistry, environmental analysis and forensic analysis, as well as from the distinctive scientific and analytical interests of the industrial partners. The programme is delivered in two stages: the first semester comprises study of modules at Keele while for the second and third semesters, students undertake extended industrial project work either at Keele or with an industrial partner in the UK.
- In addition to the development of discipline-specific research and technical skills, students will be supported in enhancing key professional and employability skills through developing critical thinking, innovation, reflective writing, autonomous learning and written and oral presentation skills: all vital skills for future employment, lifelong learning and continued professional development irrespective of the student's chosen career path.
- The focus of the MSc Analytical Science for Industry programme is learning through research and the substantial 'hands on' research training with industrial partnership makes this a distinctive course in the UK Higher Education Sector. Plus, the students can choose between either industrially-based research projects or Keele-based research projects with industrial input. The programme title encompasses the distinctive conjunction of industrial context for analytical science.





Learning and Teaching

The programme is delivered through a variety of learning and teaching activities designed to develop research and professional skills. They include the following:

- Lectures, including those from external speakers.
- Workshops, run with small groups of students, mixing both taught and practical sessions.
- Oral presentations
- Poster presentations
- Group / team work
- Independent project work
- Literature research tasks
- Directed reading
- Independent study
- Use of e-learning / the Keele Learning Environment (KLE, Blackboard)
- One-on-one meetings/discussions with individual research supervisors

Though there are taught components to the course, there is a strong focus on student-led learning and research with support from teaching staff to help develop independent research skills and technical skills. All students are expected to engage in independent study for the duration of the programme.

Assessment and Feedback

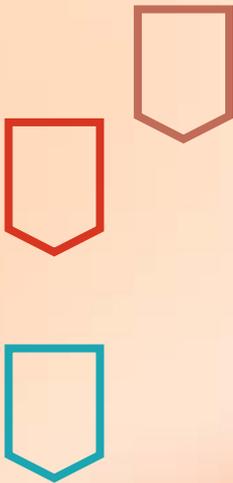
Throughout your MSc Analytical Science for Industry programme, you will be required to complete assessments of a wide variety of kinds not only to demonstrate that you have achieved the knowledge, understanding and skills required of the course but also to enable you to develop and enhance these key aspects of your learning, through the effort of undertaking the tasks we set you.

There are two types of assessment:

Formative assessments for which you get feedback on what you have done but for which no mark is formally recorded. These are intended to help you develop your skills in preparing and completing assignments and other work.

Summative assessments for which you also get feedback but additionally a mark is recorded which will contribute to your overall mark for the module in question.

In the MSc Analytical Science for Industry programme you will undertake both types of assessment throughout the course.



Structure of the MSc Analytical Science for Industry programme

The MSc Analytical Science for Industry programme runs full-time over one full year (September to September) with three semesters, Semester 1 starting in late September. It may also be part-time (either through 2Y or 3Y). Details can be found on

keele.ac.uk/analytical-science/#course-structure

The MSc Analytical Science for Industry programme totals 180-credits comprising six compulsory modules delivered across 3 semesters.

The structure of the programme is designed to develop a sound understanding of analytical science techniques and methods, generic research skills (e.g. critical reading, thinking and reflective writing, scientific writing, scientific communication and project design), along with specific research skills (e.g. laboratory methods and data analysis and interpretation) and also with the perspective of industrial research. All this is in semester 1, before the student starts to work on their research project in semesters 2 and 3.



2019 Entry - Module Information

FULL-TIME 1Y

Semester 1	Semesters 2 and 3
<p>CHE-40032 Research Skills for Analytical Science - 15 Credits Research skills both in the generic and more specific sense including literature review, research context and science communication.</p> <p>CHE-40031 Research in Industry - 15 Credits Commercial awareness and IP matters; science and technology transfer; entrepreneurship; budgeting a UK conference.</p> <p>CHE-40030 Analytical Science: Principles and Practice - 30 Credits Lecture and laboratory preparation in a range of analytical techniques including data analysis, quality control and reporting skills which would enable students from chemistry, forensic science and some bioscience degrees to access the course and prepare them for the project work.</p>	<p>MSc independent project comprises three modules of 30 / 30 / 60 credits, as described below:</p> <p>CHE-40028 MSc Independent Research Project: Research Communication - 30 credits Interview with the two supervisors at the start of Semester 2 and viva at the end of Semester 2 with the two supervisors. Oral presentation at a student conference at the end of Semester 3. All three assignments will help the student build up confidence and expertise in disseminating orally research aims and outcomes to various audiences.</p> <p>CHE-40029 MSc Independent Research Project: Report - 60 credits All experimental work must be carried out and the data analysis must be complete. Preparation of a written project report according to the given specification.</p>

CHE-40027 MSc Independent Research Project: Portfolio – 30 credits

Extensive record of training attended, laboratory skills acquired together with details of presentations given and conferences or seminars attended. Production of a work diary which will highlight skills acquired and areas where personal development is required (VITAE). This will also incorporate personal development aims enabling the student to gain confidence and maturity. Oral presentation at a student conference.

PART-TIME 2Y or 3Y

PART-TIME 2Y		PART-TIME 3Y	
Semester 1	Semesters 2 and 3	Semester 1	Semesters 2 and 3
CHE-40032 (15 cr.) CHE-40031 (15 cr.) CHE-40027 (15 cr.)	CHE-40028 (20 we.) CHE-40029 (25 we.)	CHE-40032 (15 cr.) CHE-40031 (15 cr.) CHE-40027 (10 we.)	CHE-40028 (20 we.) CHE-40029 (10 we.)
Semester 4	Semesters 5 & 6	Semester 4	Semesters 5 & 6
CHE-40030 (30 cr.) CHE-40027 (15 we.)	CHE-40028 (10 we.) CHE-40029 (35 we.)	CHE-40030 (30 cr.) CHE-40027 (10 we.)	CHE-40028 (10 we.) CHE-40029 (10 we.)
		Semester 7	Semesters 8 & 9
		CHE-40029 (50 we.) CHE-40027 (10 we.)	

* cr. : credits / we. : suggested work effort
(for module shared across more than 1 year, # of cr. = sum of we. over # of years)



Industrial Partners for the MSc Analytical Science for Industry

In 2018/19 we had several placements with companies (small and medium enterprises (SME) or international industries) either located on campus or elsewhere in the UK. As examples, a few of those previously used are:

Staffordshire County Council Scientific Services

“Reliable testing services, protecting the public”

<http://staffs-scientific-services.org/>



Thea Pharmaceuticals

“Thea Pharmaceuticals Limited is an innovative company committed to developing high-quality products which provide people with the ophthalmic care they deserve.”

www.thea-pharmaceuticals.co.uk



Dermal Technology Laboratory

“We have many years’ experience in the field of in vitro percutaneous absorption and the development of regulatory guidelines.”

www.dermaltechnology.com



I undertook the MSc Analytical Science in Industry course with Keele, because I wanted to improve my employability. My placement was looking at the effect of silica pore size on the separation of biomolecules with Thermo Fisher Scientific. The course and the industry placement provided me with the maturity of work ethic within a fast paced working environment, alongside gaining practical lab-based skills, which helped me develop as a person and resulted in me gaining a job before I finished my course.

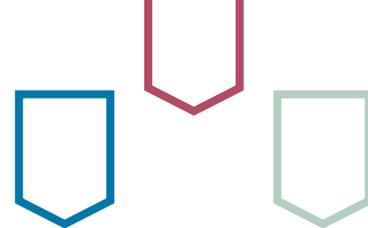
Jodie Wright



I chose to do MSc in Analytical Science for Industry degree due to the fact that it complemented my previous work experience in analytical science. I also chose it because I felt the practical experience gained through the course would be invaluable in progressing further in employment. During my course I gained a variety of skills and experiences, including practical laboratory methods, project development, as well as public speaking. This course is very useful for taking the next step in your career progression, giving invaluable and practical skills that have a real world application.

Richard Berrisford.

International Students will normally undertake a project that links with industry, this could be supported at the University or with a local partner depending upon availability. Please contact Chrystelle Egger for bursary opportunities.



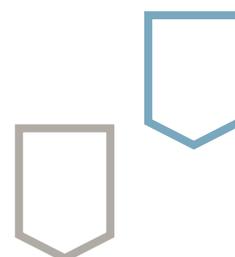
Excellent Research Facilities

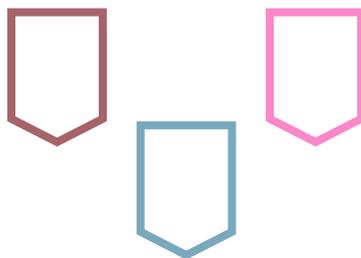
The Lennard-Jones analytical teaching laboratories are fully equipped with multiple sets of FTIR spectrometers, UV-VIS spectrometers, fluorescence spectrometers, HPLC and GC-MS instrumentation, NMR spectrometers (with probes for both solid- and liquid-state), an Inductively-Coupled Plasma Optical Emission Spectrometer (ICP-OES), and Raman microscope. Analytical Science for Industry students also have access to XRD (powder and single crystal diffraction), XRF and a scanning electron microscope (with EDX analysis) within the School, but also a range of electron microscopes (SEM and TEM) within the Faculty.

Further specialised analytical instrumentation can be found within the research laboratories either at Keele University (e.g. the research Analytical Science Laboratories, the Birchall Centre, which comprise various state-of-the-art equipment such as several mass-spectrometers, an atomic absorption spectrometer with graphite furnace, numerous chromatography-based instrumentations, a near-IR spectrometer) or within the premises of the industrial partners.

The Library has many resources for Analytical Science, both on campus and online. Further information about the library can be found at: keele.ac.uk/depts/li

Students will have access to the IT Services at the University located in the library building. There is a large number of open access PCs available for students. All student PCs use a standard platform, which includes software such as Microsoft Office, web browsers, and other standard applications.





Teaching Staff

The teaching and research profiles of the staff that deliver and support the MSc Analytical Science for Industry programme can be found at:

keele.ac.uk/scps/ourpeople/

Academic staff span different disciplines but come principally from Chemistry and Forensic Science. There are additional guest lecturers from the industrial and business sectors. The academic staff from the Faculty of Natural Sciences at Keele who are teaching in these programmes have expertise and interests within analytical science. Most academic staff are active researchers in the natural sciences, and many have a distinguished track record in publication, the generation of grant income, industrial collaborations and act as research journal reviewers. Several staff have particular interests in the development of teaching and learning methods within the natural sciences education and some are members of, and active in, the professional bodies. A number of staff are Fellow of the Higher Education Academy, have held Keele Teaching and Learning Awards, and half a dozen have been awarded the University Teaching Excellence Award. Additionally, the majority of staff contribute to widening participation and science outreach activities, and have demonstrated innovation and good practice in teaching and learning to take into account the diverse needs of all students.

Typical admission requirements for the programmes

It is expected that applicants will already hold an honours degree in a scientific discipline appropriate to the chosen research project area that includes a good basic understanding of analytical chemistry and instrumentation, although each application will be considered on an individual basis. The minimum degree category for entry onto this programme is lower second class degree, in line with the 50% pass mark required for successful completion of this course.

Consideration will be given to candidates who do not meet these criteria, but can evidence appropriate, alternative professional qualifications and/or experience.

Applicants who have not had their secondary or tertiary education through the medium of English are expected to have attained the equivalent of an IELTS score of at least 6.5 from an IELTS provider, which is approved by Keele University. Applicants are invited to contact the University before taking the IELTS test.

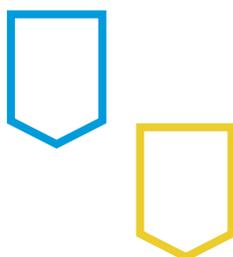
Students who apply for the MSc Analytical Science for Industry will be asked to prioritise their preferred placements and will be interviewed competitively against these for a place.

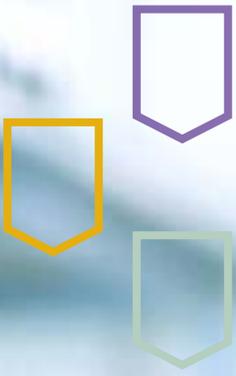
For a list of the placements offered each year, please contact the Programme Director, Dr Chrystelle Egger (see contact details on back page).

Employability Skills

The programme will enable all students to:

- Achieve a high level of scientific knowledge and skills, including transferable skills, in a UK-based or international workplace setting.
- Be able to deal with complex issues, including ethical issues, both systematically and creatively, make sound judgements in the absence of complete data, and communicate outcomes clearly to specialist and non-specialist audiences.
- Be independent and show originality in tackling and solving problems, and act autonomously in planning and implementing tasks at a professional or equivalent level.
- Develop the qualities and transferable skills necessary for employment requiring:
 - the exercise of initiative and personal responsibility,
 - confidence in decision-making in complex, unpredictable and open-ended situations,
 - the independent learning ability required for continuing professional development,
 - productive collaborative working with others.







Course Director and Admission Tutor
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keele.ac.uk/analytical-science

It is important that you read the information at keele.ac.uk/terms which explains how and why we might need to make changes to the educational services that we provide. The course information within this document applies to 2019 entry only.