

**MSci Chemistry with Molecular Physics and a Year in Industry**

This document provides a definitive record of the main features of the programme and the learning outcomes that a typical student may reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities provided. This programme specification is intended as a reference point for prospective students, current students, external examiners and academic and support staff involved in delivering the programme and enabling student development and achievement.

**Programme Information**

Award(s)	MSci			
Programme Title	Chemistry with Molecular Physics and a Year in Industry			
Programme Code	F1FH			
Awarding Institution	Imperial College London			
Teaching Institution	Imperial College London			
Faculty	Faculty of Natural Sciences			
Department	Department of Chemistry			
Associateship	Royal College of Science			
Mode and Period of Study	5 academic years, full-time			
Cohort Entry Points	Annually in October			
Relevant <a href="#">QAA Benchmark Statement(s)</a> and/or other external reference points	<a href="#">Master's Degree in Chemistry</a>			
Total Credits	ECTS:	300	CATS:	600
<a href="#">FHEQ Level</a>	Level 7			
<a href="#">EHEA Level</a>	2 <sup>nd</sup> cycle			
External Accrator(s)	Royal Society of Chemistry			
<b>Specification Details</b>				
Student cohorts covered by specification	2016/17 entry			
Person responsible for the specification	Dr Bridgette Duncombe, Director of Undergraduate Studies			
Date of introduction of programme	-			
Date of programme specification/revision	March 2017			

## Description of Programme Contents

These courses are delivered by the Departments of Chemistry, Mathematics and Physics, and are designed to train scientists for research at the interface of these three disciplines, for example in nanoengineering.

Graduates will gain strengthened knowledge of the physical and mathematical background for mastering physical methods of modern chemistry.

Years one and two of all programmes follow the same core course content supplemented by two ancillary modules that are designed for specific degree programmes. This structure allows many of our students the opportunity to transfer to a different degree programme at a later stage providing they have studied the appropriate ancillary subjects in year one.

Practical experience in the lab is a major part of all of Imperial's chemistry courses.

The year in industry courses allow students to gain experience of using chemistry in an industrial context in their penultimate year. They are one year longer than their counterparts without the year in industry, but their content is otherwise the same.

## Learning Outcomes

The Imperial Graduate Attributes are a set of core competencies which we expect students to achieve through completion of any Imperial College degree programme. The Graduate Attributes are available at: [www.imperial.ac.uk/students/academic-support/graduate-attributes](http://www.imperial.ac.uk/students/academic-support/graduate-attributes)

Upon successful completion of the programme students should be able to demonstrate:

### Intellectual Skills:

- The ability to demonstrate knowledge and understanding of essential facts, concepts, principles and theories relating to the subject areas identified
- The ability to apply such knowledge and understanding to the solution of qualitative and quantitative problems mostly of a familiar nature
- The ability to recognise and analyse problems and plan strategies for their solution
- Skills in the evaluation, interpretation and synthesis of chemical information and data
- Skills in the practical application of theory using computer software and models
- Skills in communicating scientific material and arguments
- Information technology (IT) and data-processing skills, relating to chemical information and data.

### Practical Skills:

- Skills in the safe-handling of chemical materials, taking into account their physical and chemical properties including any specific hazards associated with their use and the ability to conduct risk assessments
- Skills required for the conduct of documented laboratory procedures involved in synthetic and analytical work, in relation to both inorganic and organic systems
- Skills in the monitoring, by observation and measurement, of chemical properties, events or changes, and the systematic and reliable recording and documentation thereof

- Skills in the operation of standard chemical instrumentation
- The ability to interpret and explain the limits of accuracy of their own experimental data in terms of significance and underlying theory.

**Transferable Skills:**

- Communication skills, covering both written and oral communication
- Problem-solving skills, relating to qualitative and quantitative information
- Numeracy and mathematical skills, including such aspects as error analysis order-of-magnitude estimations, correct use of units and modes of data presentation
- Information retrieval skills, in relation to primary and secondary information sources, including information retrieval through online computer searches
- IT skills
- Interpersonal skills, relating to the ability to interact with other people and to engage in team working
- Time management and organisational skills, as evidenced by the ability to plan and implement efficient and effective modes of working
- Skills needed to undertake appropriate further training of a professional nature.

**Entry Requirements**

Academic Requirement	Grade Requirement	Minimum AAA overall
	Subject Requirements	A in Chemistry A in Mathematics A in Physics
	Excluded Subjects	General Studies
International Baccalaureate (IB)	Grade Requirement	Minimum <b>38</b> overall
	Subject Requirements	<b>7</b> in Chemistry at higher level <b>6</b> in Mathematics at higher level or <b>7</b> at standard level <b>6</b> in Physics at higher level is also required
GCSE Requirements		Pass marks in Mathematics (typically grade B or above)
English Language Requirement		<a href="#">Standard requirement</a>
Admissions Tests		Candidates may be asked to undertake an admissions test set by the College in order to provide additional information for the Admissions Tutor in support of an application.
Interview		Selected applicants only

The programme's competency standards documents can be found at:

<http://www.imperial.ac.uk/chemistry/undergraduate/course-structure-and-content/>

<b>Learning &amp; Teaching Strategy</b>	
Scheduled Learning & Teaching Methods	<ul style="list-style-type: none"> <li>• Lectures</li> <li>• Seminars</li> <li>• Tutorials</li> <li>• Practical workshops</li> <li>• Guided laboratory work</li> <li>• Problem classes</li> <li>• Field trips</li> <li>• Professional skills events</li> </ul>
E-learning & Blended Learning Methods	<p>Virtual Learning Environment (VLE) is used extensively and includes:</p> <ul style="list-style-type: none"> <li>• Lecture material and lecture recordings</li> <li>• Pre-laboratory work including competency quizzes</li> <li>• On-line quizzes and material to support lecture material</li> <li>• Plagiarism and safety awareness materials imbedded in online lecture and lab modules</li> </ul>
Project and Placement Learning Methods	<ul style="list-style-type: none"> <li>• Group project work</li> <li>• Research project</li> </ul>
<b>Assessment Strategy</b>	
Assessment Methods	<ul style="list-style-type: none"> <li>• Written examinations</li> <li>• Oral presentations</li> <li>• Written reports</li> <li>• Coursework</li> <li>• Academic posters</li> <li>• Literature report</li> </ul>
<b>Academic Feedback Policy</b>	
<p>Students can expect to receive the academic feedback in the following ways:</p> <ul style="list-style-type: none"> <li>• Academic subject tutorials in small groups throughout years 1 and 2</li> <li>• Scheduled meetings with personal tutors twice a term during Years 1 and 2</li> <li>• Scheduled meetings with personal tutors once a term during Years 3 and 5</li> <li>• Accompanying class tutorial sessions in years 3 and 5</li> <li>• Academic feedback during the year in Industry (year 4) will be provided on an ad hoc basis by the academic supervisor for the placement as well as by the industrial supervisor</li> <li>• Feedback on lab scripts will be provided to students within two weeks of submission.</li> <li>• Provisional exam results are posted to Blackboard as soon as possible</li> <li>• A brief commentary on the cohort's performance on each exam paper including a histogram of the cohort's performance is posted on Blackboard</li> <li>• The final year research project involves regular update and feedback meetings with the project supervisor</li> </ul>	

## Re-sit Policy

The College's Policy on Re-sits is available at: [www.imperial.ac.uk/registry/exams/resit](http://www.imperial.ac.uk/registry/exams/resit)

## Mitigating Circumstances Policy

The College's Policy on Mitigating Circumstances is available at: [www.imperial.ac.uk/registry/exams](http://www.imperial.ac.uk/registry/exams)

## Assessment Structure

### Marking Scheme

The pass mark for each assessment is 40%. The pass mark for each module is 40%. Exceptionally, the pass mark for the 'Maths' module is 60%.

#### Year One

A student must:

- Achieve an aggregate mark of at least 40% in each module
- Achieve a 'pass' in the 'Maths' module

#### Year Two

A student must:

- Achieve an aggregate mark of at least 40% in each module and must normally gain at least 55% overall weighted average across all written exams (i.e. inorganic, organic and physical chemistry 2 and the ancillary) to proceed into the third year

#### Year Three

A student must:

- Achieve an aggregate mark of at least 40% in the core modules 'Advanced Chemistry' and 'Chemistry Coursework 3 for Molecular Physics'
- Achieve an aggregate mark of at least 40% in the module 'Advanced Chemistry Research Topics for Molecular Physics'

#### Year Four

A student must:

- Achieve an aggregate mark of at least 50% in the Year in Industry report

#### Year Five

A student must:

- Achieve an aggregate mark of at least 40% in the 'Chemistry Coursework 4 for Molecular Physics' module
- Achieve an aggregate mark of at least 40% in each module

### Final Degree Classifications

Third – a student must achieve an aggregate mark of 40%

Lower Second – a student must achieve an aggregate mark of 50%

Upper Second – a student must achieve an aggregate mark of 60%

First - a student must achieve an aggregate mark of 70%

Year	% Year Weighting	Module	% Module Weighting
Year One	7.7%	Introduction to Chemistry	13.3r%
		Inorganic Chemistry 1	13.3r%
		Organic Chemistry 1	13.3r%
		Physical Chemistry 1	13.3r%
		Chemistry Coursework 1	36.7r%
		Maths and Physics for Chemists 1	10%
Year Two	23.1%	Inorganic Chemistry 2	18.3r%
		Organic Chemistry 2	18.3r%
		Physical Chemistry 2	18.3r%
		Chemistry Coursework 2 for Molecular Physics	35%
		Maths and Physics for Chemists 2	10%
Year Three	30.8%	Advanced Chemistry	33.3%
		Advanced Chemistry Research Topics for Molecular Physics	20%
		Chemistry Coursework 3 for Molecular Physics	46.7%
Year Four	0%	Year in Industry	100%
Year Five	38.5%	Advanced Optical Spectroscopy	8.33%
		2 x modules from elective group (A)	8.33% each
		Chemistry Coursework 4 for Molecular Physics	75%

**Indicative Module List**

Code	Title	Core/ Elective	Year	L&T Hours	Ind. Study Hours	Place- ment Hours	Total Hours	% Written Exam	% Course- work	% Practical	FHEQ Level	ECTS
CHEM40001	Introduction to Chemistry	CORE	1	73	127	0	200	100%	0%	0%	4	8
CHEM40002	Inorganic Chemistry 1	CORE	1	36	164	0	200	100%	0%	0%	4	8
CHEM40003	Organic Chemistry 1	CORE	1	37	163	0	200	100%	0%	0%	4	8
CHEM40004	Physical Chemistry 1	CORE	1	56	144	0	200	100%	0%	0%	4	8
CHEM40005	Chemistry Coursework 1	CORE	1	160	390	0	550	0%	68.53%	31.47%	4	22
CHEM40008	Maths and Physics for Chemists 1	CORE	1	55	95	0	150	85%	15%	0%	4	6
CHEM50001	Inorganic Chemistry 2	CORE	2	67	208	0	275	100%	0%	0%	5	11
CHEM50002	Organic Chemistry 2	CORE	2	79	196	0	275	100%	0%	0%	5	11
CHEM50003	Physical Chemistry 2	CORE	2	75	200	0	275	100%	0%	0%	5	11
CHEM50004	Chemistry Coursework 2 for Molecular Physics	CORE	2	219	308	0	525	0%	39.8%	60.2%	5	21
CHEM50007	Maths and Physics for Chemists 2	CORE	2	60	90	0	150	100%	0%	0%	5	6
CHEM60001	Advanced Chemistry	CORE	3	82	418	0	500	100%	0%	0%	6	20
CHEM60003	Advanced Chemistry Research Topics for Molecular Physics	CORE	3	97	203	0	300	100%	0%	0%	6	12

**Indicative Module List**

Code	Title	Core/ Elective	Year	L&T Hours	Ind. Study Hours	Place- ment Hours	Total Hours	% Written Exam	% Course- work	% Practical	FHEQ Level	ECTS
CHEM60006	Chemistry Coursework 3 for Molecular Physics	CORE	3	210	490	0	700	0%	45%	55%	6	28
CHEM60010	Year in Industry	CORE	4	0	0	1500	1500	0%	100%	0%	6	60
CHEM70012	Advanced Optical Spectroscopy	CORE	5	12	113	0	125	100%	0%	0%	7	5
CHEM70001	Chemistry Coursework 4 for Molecular Physics	CORE	5	791	334	0	1125	0%	59%	41%	7	45
CHEM70002	Advanced Catalysis	ELECTIVE (A)	5	12	113	0	125	0%	0%	100%	7	5
CHEM70004	Chemistry of Nanomaterials	ELECTIVE (A)	5	15	110	0	125	0%	0%	100%	7	5
CHEM70005	Renewable Energy from Solar Cells to Fuel Cells	ELECTIVE (A)	5	12	113	0	125	100%	0%	0%	7	5
CHEM70006	Advanced Stereo-Chemistry, Synthesis and Biosynthesis	ELECTIVE (A)	5	12	113	0	125	0%	100%	0%	7	5
CHEM70007	Molecular Imaging	ELECTIVE (A)	5	24	101	0	125	100%	0%	0%	7	5
CHEM70008	Robot Chemistry	ELECTIVE (A)	5	13	112	0	125	0%	100%	0%	7	5
CHEM70009	Plastic Electronics from Materials Chemistry to Device Applications	ELECTIVE (A)	5	12	113	0	125	100%	0%	0%	7	5
CHEM70011	Membrane Biophysics	ELECTIVE (A)	5	12	113	0	125	100%	0%	0%	7	5



## Supporting Information

The Programme Handbook is available at:

<http://www.imperial.ac.uk/chemistry/undergraduate/course-structure-and-content/>

The Module Handbook is available through the Virtual Learning Environment module "Course Summaries 2017/18"

The College's entry requirements for undergraduate programmes can be found at:

[www.imperial.ac.uk/study/ug/apply/requirements/](http://www.imperial.ac.uk/study/ug/apply/requirements/)

The College's Quality & Enhancement Framework is available at:

[www.imperial.ac.uk/registry/proceduresandregulations/qualityassurance](http://www.imperial.ac.uk/registry/proceduresandregulations/qualityassurance)

The College's Academic and Examination Regulations can be found at:

<http://www3.imperial.ac.uk/registry/proceduresandregulations/regulations>

Imperial College is an independent corporation whose legal status derives from a Royal Charter granted under Letters Patent in 1907. In 2007 a Supplemental Charter and Statutes was granted by HM Queen Elizabeth II. This Supplemental Charter, which came into force on the date of the College's Centenary, 8th July 2007, established the College as a University with the name and style of "The Imperial College of Science, Technology and Medicine".

<http://www.imperial.ac.uk/admin-services/secretariat/college-governance/charters-statutes-ordinances-and-regulations/>

Imperial College London is regulated by the Higher Education Funding Council for England (HEFCE)

<http://www.hefce.ac.uk/reg/of/>

## Modification

Changes to the assessment of module CHEM40008 'Maths and Physics for Chemists Year 1'	Programmes Committee	21 March 2017	PC.2016.75
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