1. Admissions/ Management Information

Title of the new programme – including any year abroad/ in industry variants See guidance on programme titles in Appendix V:
https://www.york.ac.uk/media/staffhome/learningandteaching/documents/policies/Framework%20for%20Programme%20Design%20-%20UG.pdf

Chemistry

Level of qualification

Please select:	Level 7

Please indicate if the programme is offered with any year abroad / in industry variants	**Year in Industry Please select Y/N**	Yes
	Year AbroadPlease select Y/N	Yes
This document applies to students who commenced the programme(s) in:	2017-18	

Awarding institution	**Teaching institution**
University of York	University of York

Department(s): Where more than one department is involved, indicate the lead department		**Board of Studies**
Lead Department	Chemistry	Chemistry
Other contributing		

Interim awards available Interim awards available on undergraduate programmes (subject to programme regulations) will normally be: Certificate of Higher Education (Level 4/Certificate),

Certificate of Higher Education (Level 4/Certificate), Diploma of Higher Education (Level 5/Intermediate), Ordinary Degree, Bachelors with honours.

UCAS code	**Route code(existing programmes only)**
F101 (year abroad), F102 (year in industry), F103 (year in York)	

Admissions criteria

A-level in Chemistry or equivalent

Length and status of the programme(s) and mode(s) of study

Programme	**Length (years)**	**Status (full-time/part-time) Please select**	**Start dates/months (if applicable – for programmes that have multiple intakes or start dates that differ from the usual academic year)**	**Mode**				
				Face-to-face, campus-based		**Distance learning**		**Other**
MChem	4	Full-time	n/a	Please select Y/N	Yes	Please select Y/N	No	Some distance learning (20 credits) is undertaken during

Language(s) of study

English

Language(s) of assessment

English

2. Programme accreditation by Professional, Statutory or Regulatory Bodies (PSRB)

2.a. Is the programme recognised or accredited by a PSRB

Please Select Y/N:	Yes	if No move to section 3

2.b. Please provide details of any approval / accreditation event needed, including: timescales, the nature of the event, central support / information required:

All existing programmes are accredited by the Royal Society of Chemistry (PSRB) and future design and development need to be considered within this accreditation framework (http://www.rsc.org/Education/courses-and-careers/accredited-courses/). Full accreditation for the new courses was obtained from the RSC in April 2017.

2.c. Does/ will approval or recognition require exceptions to University rules/practices?Please select Y/N	No	if Yes, provide details

N/A

2.d. Any additional information (e.g. student attainment required to achieve accreditation) that are required by the PSRB should be recorded here

N/A

3. Additional Professional or Vocational Standards

Are there any additional requirements of accrediting bodies or PSRB or pre-requisite professional experience needed to study this programme?

Please Select Y/N:	No	if Yes, provide details

N/A

4. Programme Leader

4.a. Please name the programme leader for the year to which the programme design applies and any key members of staff responsible for designing, maintaining and overseeing the

Nigel Lowe

4.b. How are wider stakeholders such as professional bodies and employers involved in the design of the programme and in ongoing reflection on its effectiveness?

The programme is monitored through initial accreditation and re-accreditation on a 5-year cycle through the Royal Society of Chemistry. Employer overview is achieved through the Department's External Advisory Group comprising academic and sector employer representatives. Advice from External Examiners has been solicited during preparation for approval.

5. Purpose and learning outcomes of the programme

5.a. Statement of purpose for applicants to the programme

Our degree has been carefully constructed to train the next generation of chemists, and will take students on a journey of exploration deep into the subject and up to the forefront of cutting-edge chemical research. In particular, we focus on showing applications of the fundamental chemistry, and providing practical training in a state-of-the-art facility. We undertake to develop the full range of skills, from communication and team-working to scientific literacy and problem solving, in a clear chemistry context. In this way, students will be ideally prepared for whatever comes next – be it a PhD position, research work in industry, a career in teaching, or other high-quality graduate-level work. This is reflected in our strong final destination statistics. The course is delivered with a strong focus on small group teaching and allows flexible choice between bachelors and masters programmes with the opportunity to specialise into three separate 'Chemistry with' courses in addition to Chemistry itself. 'Chemistry with' courses are defined by a distinct pathway through our specialised (rather than core) modules; all these specialised modules are optional modules on the generic Chemistry courses and the flexibility students have to switch between our named and generic courses (up to the end of Year 2, and provisional on achieving the 55% threshold required to access Year 3 MChem) means that any student can choose any specialised module provided they concomitantly change their course. On the 4-year MChem course, the fourth year can be spent using York's modern research facilities, in the research labs of one of our partner overseas universities, or on industrial placement as part of one of the UK's largest chemistry placement schemes. As the 4-year MChem qualification takes students to the research frontier of modern, interdisciplinary chemistry, it is thought to be the natural choice for those anticipating an academic or commercial career in the subject; the 3-year BSc, with its more even balance of chemistry-specific content and general training in transferable skills, is the natural choice to launch careers in a wide range of graduate professions.

5.b.Programme Learning OutcomesPlease provide six to eight statements of what a graduate of the programme can be expected to do.

PLO	On successful completion of the programme, graduates will be able to:
1	demonstrate learning and problem solving skills through the acquisition and application of a broad range of fundamental and advanced chemical principles and knowledge.
2	apply fundamental and advanced chemical principles and knowledge to the in-depth study of chemical science specialisms and the solution of problems at the forefront of the subject.
3	design and safely conduct chemical experiments through an effective risk assessment. Accurately document and record experiments to enable the effective synthesis of complex chemical compounds and advanced analysis of physical measurements, of both a quantitative and qualitative nature.
4	interpret experimental data by using mathematical skills, advanced chemical knowledge, information technology and scientific conventions.
5	effectively articulate scientific principles, experimental results and research findings in a way that is accessible to a variety of audiences through written, oral and other formats.
6	independently plan, design and conduct an extended, open-ended investigative research project to extend knowledge and understanding at the forefront of the chemical sciences.
7	demonstrate employability skills such as teamworking, commercial awareness, self-management and creativity and be equipped to work in a professional manner in their future careers consistent with the expectations of a research chemist in academic, governmental or commercial positions.
8	

5.c. Programme Learning Outcome for year in industry (where applicable)For programmes which lead to the title 'with a Year in Industry' – typically involving an additional year – please provide

For the Year in Industry PLO 6 is modified to independently plan, design and conduct an extended, open-ended investigative research project in an industrial environment to extend knowledge and understanding at the forefront of the chemical sciences.

5.d. Programme Learning Outcome for year abroad programmes (where applicable)For programmes which lead to the title 'with a Year Abroad' – typically involving an additional year – please

For the Year Abroad PLO 6 is modified to independently plan, design and conduct an extended, open-ended investigative research project at an overseas university to extend knowledge and understanding at the forefront of the chemical sciences.

5.e. Explanation of the choice of Programme Learning OutcomesPlease explain your rationale for choosing these PLOs in a statement that can be used for students (such as in a student

i) Why the PLOs are considered ambitious or stretching?
The PLOs describe a journey from consolidating basic chemical principles at the start of the course through to contributing to cutting-edge research in core and interdisciplinary chemistry at the end. The range of formative learning experiences in lecture, laboratory, workshop and tutorial, allied to independent work in individual and group settings, provide a structured training to meet the aspiration of the PLOs. The summative assessment points, including formal examinations, assessed presentations and extended research projects, allow the achievement of the knowledge, skills and attributes of the PLOs to be demonstrated.
ii) The ways in which these outcomes are distinctive or particularly advantageous to the student:
The outcomes are advantageous as they ensure that the research-led teaching of chemical science is integrated with the development of laboratory, problem solving and employability skills. This will ensure that the York Chemist has all the technical and employability skills needed in his/her future career regardless of whether this career lies inside or outside the chemical sciences. The PLOs remind students that the course provides an education through chemistry as well as an education in chemistry. The year 4 experience in particular (PLO6) makes the MChem ideal preparation for those thinking of careers in chemistry whether in industry or further study in academia.
iii) How the programme learning outcomes develop students' digital literacy and use technology-enhanced learning to achieve the discipline and pedagogic goals which support active student learning through peer/tutor
Chemistry students develop effective communication and related skills through regular application of digital literacy skills. In Year 1, students will give an oral presentation and prepare a team poster on a practical project involving presentation software and specialist molecular drawing packages including the use of molecular graphics with the Protein Data Bank (PDB). They also carry out a public communication of science exercise, producing a popular science article or YouTube video aimed at explaining an application of polymer science. Some student videos have had thousands of views globally and been highlighted by international chemistry magazines. In Year 2, communication skills are enhanced by the smartphone video recording and sharing of group presentations and feedback thereon. Students use specialist software and databases used to visualise proteins and to calculate properties of small molecules. Year 3 focuses on scientific report-writing consistent with research publications through effective use of search tools and databases to access reserach literature. Computational approaches continue to include applications of quantum chemistry. Data manipulation and analysis in laboratory work frequently involve the use of scientific software, with appropriate training. In Year 4, open learning is supported by technology-enhanced learning tools. The Department makes near comprehensive use of lecture recording, and all modules are supported by material on the VLE including screencasts, external links and quizzes, with pockets of use of 'flipping' and 'clicker' technology. The VLE is exploited variously for online workflow management including submission of summative assessments.
iv) How the PLOs support and enhance the students' employability (for example, opportunities for students to apply their learning in a real world setting)? http://www.york.ac.uk/about/departments/support-and-admin/careers/staff/
At the start of Year 1, students take part in 'The Happening' – a fun, industrially-led event, in which they get to know other students as they work in teams to solve a real-world chemical problem. In Year 1, they also carry out Integrated Chemistry Team Practical Projects in which the contents of a 'typical' night out are analysed – junk food, alcohol and a 'morning-after' coffee, to determine levels of fat, protein, alcohol, sugar and caffeine. This develops research, time-management and team-working skills. In Year 2, these ideas of team-working are developed much further in the 'Group Exercises', in which they work in smaller teams in a mock industrial company to solve a real-world chemistry problem. The suite of exercises covers various aspects of the chemical and related industries, the development of which was supported by the industries themselves. Having to organise meetings, keep minutes and consider financial implications also helps develop business skills. Year 3 research-focused Miniprojects and Year 4 Research project (York, overseas, industrial placement) introduce and then develop the planning of open-ended research – only by collaborating effectively as part of a group can students achieve an optimal understanding of the complex topic they are studying – exactly as in modern interdisciplinary research. Chemistry at York is an Athena Swan Gold department, and we foster an inclusive atmosphere, particularly through our team-working exercises, in which students will be encouraged to recognise the contributions of all the diverse members of their team.
v) Consultation with Careers
The Department has a dedicated Careers Liaison Officer who works closely with the Industrial Placement Coordinator to circulate information and opportunities to students and to deliver training through CV Writing and Interview Skill workshops. These are delivered in collaboration with staff from Careers. The new course will retain the current links to, and involvement of, Careers from the current course. For this reason, we have not consulted directly with the Careers service during the planning of the new course.
vi) How will students who need additional support for academic and transferable skills be identified and supported by the Department?

The Department has two principal mechanisms for identifying students who require additional support. Firstly, any student whose assessment results are either poor or failing are identified by the appropriate examinations officers and then written to by the Chair of the Board of Studies and counselled by their supervisors. These students will meet with the Student Welfare Officer and their supervisors and a personal learning plan developed. Secondly, the need for individual support is identified through our college teaching system where progress is monitored weekly. Student supervisors review progress at the end of term meetings and any actions identified. All new students are assigned a mentor who is studying in a higher year in the same chemistry college as them. These mentors can provide advice on a range of social issues, such as preparing for arrival at university, settling into York or finding good student houses in the second year, as well as on academic issues such as option module choices. Furthermore, there are centrally-timetabled revision classes, run by the mentors, to provide academic peer-to-peer support to the benefit of mentees and mentors. This scheme demonstrates how our chemistry college system helps to break down barriers and enables students to make personal connections across a large chemistry department.

vii) How is teaching informed and led by research in the department/ centre/ University?

The Department of Chemistry has a research-led teaching philosophy. Although most of the core material in Years 1 and 2 is common in UK Chemistry Departments, in Year 3 material aligns with the research specialisms in the Departments. Furthermore, the option module structure has been specifically designed to reflect the research expertise in the Department with courses on environmental, sustainable, analytical and biological/medicinal chemistry as well as options on mechanistic chemistry and advanced spectroscopy.

5.f. Stage-level progressionPlease complete the table below, to summarise students' progressive development towards the achievement of PLOs, in terms of the characteristics that you expect

Stage 0 (if your programme has a Foundation year, use the toggles to the left to show the hidden rows)

Stage 1

On progression from the first year (Stage 1), students will be able to:	*demonstrate an understanding of core chemical principles that will underpin studies at subsequent stages (PLO1). By working through guided activities in our laboratories, students will also have acquired key laboratory skills for the synthesis and analysis of chemical compounds (PLO3) and had experience of acquiring, recording, processing and analysing physical data (PLO4). Students will also have developed the key quantitative, mathematical and IT skills needed for further study (PLO4) through 'Skills for Chemists' and self-directed, independent learning including, for example, the use of Excel in linear regression analysis. Students will begin to acquire invesitgative (PLO6) and communication (PLO5) skills through the ICP lab-based activity, and communication skills in a range of media developed in the 'Macromolecules' self-study package. Personal skills (PLO7) are developed through small-group teaching environments, through group work in laboratories and 'Becoming a Professional Chemist' presentations and through 'The Happening' activity.*

PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8
Individual statements							

Stage 2

On progression from the second year (Stage 2), students will be able to:				*demonstrate an understanding of chemical principles at an intermediate level and how they may be applied to solve unseen, complex problems that begin to challenge basic theories (PLO1). Through the teaching of 20 credits of option modules, they will gain a more detailed knowledge of aspects of chemical science specialisms with the added complexity of interdisciplinarity (PLO2). The Advanced Synthesis laboratory course will develop techniques necessary to handle sensitive and potentially hazardous materials in a controlled manner (PLO3) whilst physical chemistry practical work brings a deeper consideration of data acquisition and analysis involving the use of software in processing (including the use of Excel in non-linear regression analysis) and presentation (PLO4, PLO5) and simulation of experiments to inform experimental design in Hammett Lab (PLO6). Awareness and practice of employability skills with a view to developing future career paths (PLO7) continue to be developed through tutorial and workshop teaching and by collaboration in laboratory work. Intermediate levels of written and oral communication (PLO5) and teamworking skills (PLO7) are developed through the Year 2 Group Exercises and the focus on*			
PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8
Individual statements							
Stage 3							

(For Integrated Masters) On progression from the third year (Stage 3), students will be able to:	*demonstrate an understanding of complex chemical principles, recent developments and applications in the field from a research-led perspective (PLO1). Through the study of a further 40 credits of option modules, students will advance their knowledge of science specialisms (PLO2) engaging with the forefront through research literature and problem solving. Students will learn advanced laboratory techniques including inert atmosphere manipulations and handling catalytic reactions, and analyse reactions through the application of spectroscopy during the Advanced Practicals (PLO3). They will have performed investigative research projects involving the design and implementation of novel experiments which require direct engagement with the primary chemistry literature (PLO6) and advanced analysis of data (PLO4) from a wide range of instrumental analytical techniques during the Miniprojects. Presentation (written, oral and poster) skills (PLO5) will have been enhanced through the reporting of Advanced Practicals and Miniprojects, and engagement with experimental design and the interpretation of research literature further developed (PLO6). Collaborative skills and interpersonal communication skills continue to be developed through tutorial/workshop teaching and especially through the group Miniproject investigative project work (PLO7). Additionally, at graduation, MChem students will demonstrate an understanding of complex chemical principles, recent developments and applications in the field from a research-led perspective through studying advanced and synoptic elements of chemistry through Open Learning (PLO1,2) engaging with the forefront through research literature and problem solving. Students will learn advanced laboratory and research techniques (PLO3) through MChem research projects involving the design and implementation of novel experiments which require direct engagement with the primary chemistry literature (PLO6) and potentially advanced analysis of data (PLO4) from a wide range of instrumental analytical techniques. Presentation (written, oral) skills (PLO5) will have been enhanced through the reporting of MChem projects, and engagement with experimental design and the interpretation of research literature further developed (PLO6). Collaborative skills and interpersonal communication skills continue to be developed through MChem project work within research groups, with the possibility that this is conducted in industry (Yr Ind) or at an overseas university (Yr Abr) (PLO7).*

PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8
Individual statements							

5.g. Other features of the programme

i) Distance Learning

Please Select Y/N:	No	if Yes, you are required to submit to Teaching Committee: [Checklist for Distance Learning Programmes](#)

ii) Involvement of partner organisations

Please Select Y/N:	No	if Yes, outline the nature of their involvement (such as contributions to teaching, placement provision). Where appropriate, see also the: [University guidance on collaborative provision](#)

N/A

iii) Internationalisation/ globalisation

The Department regularly recruits a small but significant number of undergraduates from around the world. The make-up of our academic staff and especially our large international postgraduate cohort create an appropriately supportive atmosphere. The postgraduate-led 'Chemical Interactions' society runs a number of events during the year to which all staff and student members are invited and these are often run along internationally-themed lines. We regularly host Erasmus students within Chemistry modules and our Yr Abroad scheme places ca. 15 Year 4 students annually in partner universities around the world.

iv) Inclusivity

This refers to the protected characteristics and duties on the University outlined in the Equality Act 2010

With over 10 years of accreditation at Gold level under the Athena SWAN scheme, the Department is justifiably proud of its record in this area. In addition to a Student Welfare Officer, the Department has identified a Disability Officer, a Women's Officer, a Study Skills Officer and a Harassment Officer. Additionally, a number of staff and students have contributed articles and participated in events focusing on LGBT contrbutions to the discipline. We maintain a quiet room/prayer room for the use of staff and students. An Equality & Diversity session on inclusivity/unconscious bias is part of the Year 1 'Becoming a Professional Chemist' activity emphasising its importance to teamworking in the modern workplace. The Department participates actively in the Widening Participation initiative through targeted admission and outreach activities involving schools not traditionally supplying York with Chemistry undergraduates.

v) Summer term weeks 8-10

This period is home to our ICP laboratory-based group research projects at the end of Year 1 and to the Group Exercise and Career-focused activities of Year 2. Currently, there are no timetabled activities in this slot at the end of Year 3 not least because up to a third of the cohort may be actively preparing to take up industrial placements or to commence study overseas in Year 4.

6. Reference points and programme regulations

6.a. Relevant Quality Assurance Agency benchmark statement(s) and other relevant external reference pointsPlease state relevant reference points consulted (e.g. Framework for Higher

https://www.york.ac.uk/media/staffhome/learningandteaching/documents/policies/Framework%20for%20Programme%20Design%20-%20UG.pdf

http://www.qaa.ac.uk/assuring-standards-and-quality/the-quality-code/subject-benchmark-statements

http://www.qaa.ac.uk/publications/information-and-guidance/publication?PubID=2843#.VthM1fmLS70

The PLOs were designed to capture the spirit of York Pedagogy whilst retaining the scope of the national subject benchmark statements for chemistry and, for accreditation purposes, the requirements for breadth and depth of coverage specified by the Royal Society of Chemistry.

6.b. University award regulations

The University's award and assessment regulations apply to all programmes: any exceptions that relate to this programme are approved by University Teaching Committee and are recorded at the end of this document.

6.c. Are students on the programme permitted to take elective modules?

(See: https://www.york.ac.uk/media/staffhome/learningandteaching/documents/policies/Framework%20for%20Programme%20Design%20-%20UG.pdf)

Please Select Y/N: Yes

7. Programme Structure

7.a. Module Structure and Summative Assessment Map

Stage 0 (if you have modules for Stage 0, use the toggles to the left to show the hidden rows)

Stage 1

Credits	Module		Autumn Term										Spring Term										Summer Term									
	Code	Title	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
30	CHE00015C	Core 1: Fundamentals of Chemistry	S								A		EA																			
30	CHE00016C	Core 2: Chemical Properties & Analysis											S					A										EA				
30	CHE00017C	Core 3: Molecules & Reactions											S											A				EA				
20	CHE00018C	Year 1 Practical Chemistry	S									A										A		A	A	A				A	A	EA
10	CHE00019C	Skills for Chemists	S									A	A															EA				

Stage 2																																
Credits	**Module**		**Autumn Term**										**Spring Term**										**EA**									
	Code	**Title**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
20	CHE00016I	Core 4a: Molecules in Action	S										EA																			
20	CHE00017I	Core 4b: Theory, Analysis & Mechanisms	S						A				EA																			
30	CHE00018I	Core 5: Reactivity											S										A					A			A	E
30	CHE00019I	Core 6: Spectroscopy & Chemistry											S										A					EA				
20		Option List A											S									A						EA				
Stage 3																																
Credits	**Module**		**Autumn Term**										**Spring Term**										**Summer Term**									
	Code	**Title**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
20	CHE00026H	Core 7: Advanced Concepts	S																		A							EA				
20	CHE00027H	Core 8: Synthesis & Structures	S														A											EA				
20	CHE00028H	Core 9: Compounds & Materials	S																									EA				
20	CHE00005H	Advanced Practical Research Training	S					A			A		A									A	A								E	
20		Option List B	S						A				EA																			
10		Option List C											S							A								EA				
10		Option List D											S											A				EA				
Stage 4																																
Credits	**Module**		**Autumn Term**										**Spring Term**										**Summer Term**									
	Code	**Title**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
90	CHE00015M	MChem Research Project	S																							A		EA				
10	CHE00011M	Literature Review	S																							EA						
20		Core 10: Advanced Chemistry	S																									EA				

7.b. Optional module listsIf the programme requires students to select option modules from specific lists these lists should be provided below. If you need more space, use the toggles on the left to

Option List A	**Option List B**	**Option List C**	**Option List D**	**Option List E**	**Option List F**	**Option List G**	**Option List H**
The Material World: Green Chemistry & Dynamic Earth: Genes to Proteins	Reaction Intermediates & Mechanisms Catalysis with Green Technologies Atmospheric Chemistry (CHE00031H) Chemistry & Disease (CHE00030H)	Synthesis - from Chemical and Chemical Theory &	Analytical & Bioinspired Lasers in Chemistry				

7.c. Explanation of the programme and assessment designThe statements should be in a form that can be used for students (such as in a student handbook). It should make clear to students

i) Contact with staff

Students meet our internationally recognised researchers through lectures, small group tutorials/workshops and laboratory sessions. Lectures deliver information (PLO1,2) but much more with demonstrations, interactive problem solving (e.g. with access to model kits) and illustrative examples from academic and "real-world" contexts. Some staff use 'flipped' material and 'clickers' to enhance interactivity. Typical support materials used include quizzes, extra links and screen-casts on the VLE, with links to Twitter and YouTube. Small group learning through our teaching college system provides supportive teaching through a mixture of tutorials (groups of 5 students) and workshops (groups of 20-25). These sessions tackle conceptual difficulties and challenge students to

ii) Students' independent study and formative work

The programme has been designed with our small-group college teaching system at its core. It is our belief (and comprehensively evidenced through student evaluations) that these activities are central to student learning and skill development. The majority of students' independent work and formative assessment is associated with small group teaching (PLO1,2,5,7). Laboratory work in Year 1 focuses on developing laboratory skills. Weekly assessment is formative with occasional summative assessments being used to evaluate levels of competence. The focus of assessment will shift from rewarding attendance and report submission in favour of directly assisting the acquisition and demonstration of key laboratory skills (PLO3-7). Taught material in Year 4 is delivered as

iii) Summative Assessment

Summative assessment through exams remains key to testing PLOs 1 & 2 and builds directly on the formative assessment of work submitted in connection with supporting tutorials and workshops. Limited past papers are made available to reinforce exam preparation, and feedback and outline answers to all exams are provided to consolidate learning at the end of modules. The Department makes use of various forms of continuous assessment that reduce the burden of formal exams and allow complementary skills to be developed and assessed. Continuous assessment types include open-book and 'closed' assessed workshops (PLO1,2,4), assessed presentations and/or written assignments (PLO1,2,5), including group work (PLO1,2,7), and project-type work (PLO1,2,4,6).

8. Contribution of staff

8.a. Please outline (where applicable) the contribution of Postgraduate who Teach (PGWTs) to the programme. The programme must comply with the University Policy on PGWTs (http://www.york.ac.

PGWTs are principally involved in support and delivery of laboratory teaching. They play a direct role in teaching aspects of experimental and instrumental technique to students and advising them on data collection and interpretation particularly in the area of spectroscopy. This is achieved through a combination of participation in teaching sessions, formative assessment and summative assessment based on closely defined, moderated mark schemes. PGWTs are encourage to mentor students by making links between their own research and the activities students meet in a more didactic setting. They also play a key role in helping to maintain high H&S standards across all years and advising on aspects of experimental design for project execution in Yrs 3 & 4.

8.b. If casual teaching staff and/ or staff external to the University will be involved in delivery of the programme, please outline how they will contribute and how the programme team will ensure

A number of external experts have contributed over recent years to the delivery of case studies in a number of options. This is expected to continue for the AF module. External contributors are targeted due to their specific technical knowledge and experience that is complementary to academic staff. They deliver sessions in the presence of York academic staff and are not directly involved in assessment. Student feedback is collected on external speakers and has often identified the advantageous impact of these sessions.

9. Study Abroad (including Year Abroad as an additional year and replacement year)

Students on all programmes may apply to spend Stage 2 on the University-wide North America/ Asia/ Australia student exchange programme. Acceptance onto the programme is on a competitive

https://www.york.ac.uk/staff/teaching/procedure/programmes/design/

Please Select Y/N:	Yes	if No move to section 10

9.a.Will the department need to agree new/ additional study abroad partnerships in order to offer this programme?

Please Select Y/N:	No

9.b.Please briefly detail the nature of the study abroad (tick and/ or provide additional detail as appropriate):

i) Is it an additional/ replacement year?	replacement year

Additional details:

Year 4 of the MChem integrated masters can be spent in York, on industrial placement or under existing arrangements at a range of overseas partner universities. The structure of the year is essentially the same comprising M-level study of an independent research project (90 credits), a literature review module (10 credits) and open-learning advanced topics (20 credits).

ii) Is it compulsory/ optional element of the programme? (please select)	optional element

Additional details:

Students finalise their choice of Year 4 route during Year 3.

iii) If it is an additional year, is it direct entry/ transfer in? (please select)	

Additional details:

n/a

iv) How will students taking Study Abroad be assessed?

The 10-credit literature review module is assessed independently through the written review and reference list by two academic staff in York (the review topic being linked naturally to the project). The same pair of assessors mark the project report, accounting for 40% of the 90-credit project module mark, and assess the accompanying oral presentation and viva (with project-specific and synoptic elements) in York at the end of the year, accounting for a further 25%. The remaining 35% of the project module mark comes from a project execution mark that is generated by the project supervisor in the overseas university. All marking follows closely defined mark schemes and project execution marks are moderated by the Department's Yr Abroad officer and the Chair BoE. The 20-credit open learning module is assessed in the Summer common assessment period through a written exam, covering the open-learning-delivered M-level advanced topics and underlying synoptic knowledge both linked to the study of a selection of recently produced York research papers. Students must answer a question on three different topics.

v) Can it be reassessed? (please select Y/N)	Yes	Explain how:

Explain how:

Resits are available for the open learning module. The lit review can be re-submitted. The project report can be re-submitted in the University-defined case of a marginal fail.

vi) If a student fails the Study Abroad which programme will they transfer onto or will they leave the University?

Students graduate with a BSc Hons degree based on their results at the end of Year 3.

vii) How will the programme team manage the risks associated with offering Placement Learning and Study Abroad?

The Department has many years experience of running both placement and study abroad MChem degrees under former programmes. We have separate members of staff monitoring both programmes during recruitment (to placement or year abroad) and execution. Academic staff supervise both types of project in collaboration with a 'local' supervisor and this includes a site visit and a mid-year interim meeting in York (the latter only in the case of placements). Partner institutions and industries are rigorously vetted before being admitted to either scheme because of the specific M-level requirements of York placements. We have built up a formidable list of regular destinations featuring companies and universities who are familiar with our working practices.

10. Work-based learning (including years in industry)

It is strongly recommended that departments that do not already have an established work-based learning programme should contact Careers for help and advice.

10.a. Does the programme include the opportunity to undertake work-based learning/ placements, including years in industry? All such programmes must comply with the policy on work-based

https://www.york.ac.uk/staff/teaching/procedure/programmes/design/

This should include the signing of learning agreements between the student, department and work-place

Please Select Y/N:	Yes	if No move to section 11

i) Is it a compulsory or optional element of the programme?

Please Select:	optional

ii) Briefly detail the nature of the work-based learning:

Year 4 of the MChem integrated masters can be spent in York, on industrial placement or under existing arrangements at a range of overseas partner universities. The structure of the year is essentially the same comprising M-level study of an independent research project (90 credits), a literature review module (10 credits) and open-learning advanced topics (20 credits). On industrial placement, the 90-credit research project is conducted within the placement company in the area of its operations. In some cases, the project covers the day-to-day work of the student within the company; in others, the company allows the student to complete the required amount of research in addition to their more routine role within the placement.

iii) Who will be responsible for sourcing and arranging the placement:	Student

Additional details:

Placements are obtained through a standard application/interview process in competition with students from around the country. The Department's strong connections with a significant number of companies and reputation for providing strong performing placement students means that many companies target the Department specifically when recruiting. Running placements in Year 4 means that York students are more knowledgeable and more mature than many from competitor departments.

iv) Is the work-based learning an additional year in industry?

Please Select Y/N:	No	if No move to section 10.b.

v) Is it direct entry/ transfer in? (please select)	

Additional details:

N/A

vi) What will be the criteria for the selection of locations for work-based learning?

N/A
vii) How will the department ensure a sufficient number of work-based learning opportunities?
N/A
viii) How will the department make work-based learning providers aware of their responsibilities?
N/A
ix) How will the department make students aware of their rights and responsibilities?
N/A
x) How will students taking a year in industry be assessed?
N/A
xi) Can it be reassessed?
Please Select Y/N:
if yes, please explain how:
N/A
xii) How will the programme team manage the risks associated with offering a year in industry?
N/A
10.b. For programmes involving other forms of work-based learning other to years in industryIt is strongly recommended that departments that do not already have an established work-based All such programmes must comply with the policy on work-based learning and placements https://www.york.ac.uk/staff/teaching/procedure/programmes/design/ This should include the signing of learning agreements between the student, department and work-place

i) What will be the criteria for the selection of locations for work-based learning?
The Department's Industrial Placement Officer ensures that all companies involved in the scheme have the facilities and scope within their daily operations to support an M-level research project in addition to providing workplace experience. The companies must agree, subject to confidentiality agreements, that results can be reported by students in sufficient specific detail to allow objective assessment of the project. Students cannot apply to placements outside the agreements established between Chemistry in York and existing company signatories to our agreements.
ii) How will the department ensure a sufficient number of work-based learning opportunities?
Our previous experience under existing programmes ensures that we have have established a working relationship with a wide range of companies in the UK and Europe. Companies demonstrate a loyalty to the Department based on their satisfaction with previous recruits. In recent years, the Department has regularly placed between 50 & 60 students. Whilst this is a smaller number than the number of students who register interest in the scheme end of Year 2, most students who actively pursue placements during Year 3 are successful in obtaining a placement.
iii) How will the department make work-based learning providers aware of their responsibilities?
Companies sign up to our existing placement scheme on the basis of an understanding of the way our integrated masters Year 4 placement scheme works. This negotiation will continue under the aegis of our Industrial Placement Officer.
iv) How will the department make students aware of their rights and responsibilities?
Students are briefed by the Department's Industrial Placement Officer on an individual basis immediately before the placement begins. There is also a placement handbook and an academic supervisor who oversees the placement from the York side.
v) How will students undertaking work-based learning be assessed?
The 10-credit literature review module is assessed independently through the written review and reference list by two academic staff in York (the review topic being linked naturally to the project). The same pair of assessors (academic project supervisor and IPM) mark the project report, accounting for 40% of the 90-credit project module mark, and assess the accompanying oral presentation and viva (with project-specific and synoptic elements) in York at the end of the year, accounting for a further 25%. The remaining 35% of the project module mark comes from a project execution mark that is generated based on indications by the industrial project supervisor at the placement company following closely defined mark schemes and moderated by the Department's appointed placement supervisor. The 20-credit open learning module is assessed in the Summer common assessment period through a written exam, covering the open-learning-delivered M-level advanced topics and underlying synoptic knowledge both linked to the study of a selection of recently produced York research papers. Students must answer a question on three different topics.
vi) Can it be reassessed?
Please Select Y/N: Yes
if yes, please explain how:
Resits are available for the open learning module. The lit review can be re-submitted. The project report can be re-submitted in the University-defined case of a marginal fail.(max 200 words)
10.c. Support for students on work-based learning
i) How will students be briefed prior to, and de-briefed after, work-based learning?
Those students successful in securing industrial placements are centrally briefed by the Department's Industrial Placement Officer and will already have access to the placement Handbook. All students are individually briefed at the end of Year 3 prior to commencement of placements covering aspects of H&S, disclosure of disabilities and reminders of the expectations and assessment of the placement. All students are requested to submit a questionnaire at the end of the placement providing the opportunity to reflect on their experience during the year and provide feedback on the specific placement offered by their company.
ii) Who in the department will be responsible for overseeing students whilst they are undertaking work-based learning?

(max 200 words) The Industrial Placement Officer (currently Dr Brian Grievson) will continue to oversee the Year in Industry scheme from advertising the scheme to students, liaising with companies to invite them to offer interviews inside the Department and provide links to external interviews and online applications, through to collecting feedback from students and reviewing the list of companies listed within the scheme. This involves working closely with the companies themselves. During the placements, students on placement have an industrial project supervisor within the company and an academic project supervisor from York.

iii) By what means (e.g. work-based mentors, VLE, ongoing communication with the department) will students be supported when undertaking work-based learning?

Placement students are visited on site by their academic project supervisor in the first few months of placement and have email contact throughout. All students return to York for a formative presentation/viva in the third week of Spring Term involving the academic project supervisor, an academic IPM and the industrial project supervisor. Future research plans are refined at this meeting. Students send a draft of each of their literature review and final report for comment by the academic project supervisor prior to the submission of the final documents. Students are supported in the workplace by the company's project supervisor and often by co-workers on site.

iv) How will any work-based mentors be trained and utilised?

n/a(max 200 words)

v) If mentors/ employers are to be involved in assessment how will they trained, supported and monitored?

Industrial project supervisors complete a pro forma with detailed level descriptors in order to award a project execution mark to the student. These marks (35% of module mark) are moderated by the Department's appointed placement supervisor who checks that evidence for achievement matches the awarded grades. (max 200 words)

vi) How will work-based learning be monitored and reviewed?

Principally through the placement review conducted through student questionnaires and overseen by the Indistrial Placement Officer.

Careers & Placements - 'With Placement Year' programmes

Students on all undergraduate and integrated masters programmes may apply to spend their third year on a work-based placement facilitated by Careers & Placements. Such students would return

In exceptional circumstances, UTC may approve an exemption from the 'Placement Year' initiative. This is usually granted only for compelling reasons concerning accreditation; if the Department

Programme excluded from Placement Year?	No	If yes, what are the reasons for this exemption:

11. Additional information

11.a. Recognition of prior learning / credit transferWill this programme involve any exemptions from the University Policy and Procedures on Credit Transfer and the Recognition of Prior

Please Select Y/N:	No	

11.b. Continuing Professional Development

Please Select Y/N:	No	

if yes, please explain how:

11.c. Ethical considerationsDoes the programme give rise to any ethical issues, which might warrant wider consideration within the University? (E.g. will the programme receive sponsorship

Please Select Y/N:	No	if yes, please provide brief details to be referred onto the appropriate body within the University:

if yes, please provide brief details to be referred onto the appropriate body within the University:

11.d. Student involvement in programme developmentHow were current and/ or former students involved in the development of this proposal/ programme?

Student representation at DTC allows current students to share their thoughts about the design of the course. This consultation process is ongoing. During recent course re-design (as minuted at DTC 19/10/16) initial student responses include recognition of the benefits of rationlising content into fewer modules with the potential to reduce assessment-related workload for staff and students. We have previously monitored regular discussion of the challenge posed by multiple assessment points at our Staff Student Forum in coming to a decision about moving to fewer, larger modules. (This idea was also raised through a recent External Review and by Periodic Review; York Pedagogy has provided a route to rationalisation) We have monitored module and course (NSS) feedback from students to identify and retain popular aspects of our courses.

11.e. External Examiners

i) Will any additional external examiners need to be appointed for the programme?		
Please Select Y/N:	No	
ii) Does the programme team envisage any difficulties in obtaining appropriate external examiners?		
Please Select Y/N:	No	
iii) Will any external examiners be drawn from outside academia? (please select Y/N)	No	

Additional details:

N/A

11.f. Transfers out of or into the programme

ii) Transfers into the programme will be possible? (please select Y/N)	Yes	

Additional details:

Students registered for the BSc programmes are entitled to transfer into MChem Chemistry up to the end of Year 2 provided their Yr2 mark exceeds the 55% threshold.

ii) Transfers out of the programme will be possible? (please select Y/N)	Yes	

Additional details:

Students registered for the MChem programme are entitled to transfer into other named MChem programmes at any stage provided, at the appropriate points, they achieve the 55% threshold at the end of Yr2, achieve a 50% average across Yr2 & Yr3, and studiy the appropriate option modules and project/lit review/open learning areas for the named MChem programme in question. Provided thay have achieved at least 40%, MChem students may transfer into the BSc programme/s up to the end of Yr2.

12. Exceptions to University Award Regulations approved by University Teaching Committee

ExceptionPlease detail any exceptions to University Award Regulations approved by UTC	**Date approved**
n/a	

Quality and Standards

The University has a framework in place to ensure that the standards of its programmes are maintained, and the quality of the learning experience is enhanced.

More information can be obtained from the Academic Support Office:

http://www.york.ac.uk/about/departments/support-and-admin/academic-support/staff/#quality

Date on which this programme information was updated:

30/08/2019
Departmental web page:
https://www.york.ac.uk/chemistry/
Please note:The information above 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

Programme Map: Module Contribution to Programme Learning Outcomes

This table maps the contribution to programme learning outcomes made by each module, in terms of the advance in understanding/ expertise acquired or reinforced in

Stage	Module		Programme Learning Outcomes							
			PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8
			demonstrate	apply	design and safely	interpret	effectively	independently	demonstrate	
Stage 1	Core 1: Fundamentals of Chemistry	Progress towards	Developing an			Data analysis	Development of		Developing	
		By working on	Engaging with			Data analysis in	Preparation of		Preparing for and	
Stage 1	Core 2: Chemical Properties & Analysis	Progress towards	Developing an			Data analysis	Development of		Developing	
		By working on	Engaging with			Data analysis in	Preparation of		Preparing for and	
Stage 1	Core 3: Molecules & Reactions	Progress towards	Developing an			Data analysis	Development of	Literature	Developing	
		By working on	Engaging with			Spectral data	Preparation of	Macromolecules	Preparing for and	
Stage 1	Practical Chemistry	Progress towards			Development of	Data analysis	Development of	Develop	Developing	
		By working on			Laboratory	Data analysis	Preparing outline	Use of databases	Group	
Stage 1	Skills for Chemists	Progress towards	Key biological,			Learning key	Communication	Develop	Developing	
		By working on	Building a			Mathematics for	The Happening -	Becoming a	The Happening -	
Stage 2	Core 4a: Molecules in Action	Progress towards PLO	Developing an understanding of organic, biological and physical chemistry at an intermediate level.		Develop intermediate skills required for synthetic inorganic and organic chemistry including handling air and water-sensitive materials and pyrophorics. Working safely in the laboratory	Data analysis	Development of written and oral presentation skills.		Developing professional modes of behaviour, with respect to sharing resources, learning and adhering to standard laboratory practice, and working well with others	

		By working on (and if applicable, assessed through)	Engaging with lectures and learning support activities on Safety, Biomolecules in Action, Retrosynthetic analysis, Organic synthesis with enolate equivalents, Solution and mixtures. Applications to unseen problems in tutorial and workshops. Formative assessment is through small-group tutorial/workshop assignments in each topic and summative assessment through an online assessment (Safety) and a closed-book examination (January).		Experiments within the Advanced synthesis practical. Safety lecture course and assessment highlights good working practice. Core and advanced laboratory skills are formatively assessed during the Skills exercise then summatively assessed on a weekly basis principally through in-lab assessments during the first half of term.	Analysis of data within Advanced synthesis practical, including use of specialist software (NMR processing). Introduction to multinuclear NMR and vib/rotn spectroscopy. Formative assessment through optional post-lab tasks. Summative assessment through selected assessed post-lab tasks. Formative assessment through related tutorial and workshop problem-solving activities.	Preparation of written tutorial and workshop exercises. Engagement in tutorials and workshops. Formative assessment of articulation of intermediate scientific concepts in writing and oral presentation. Summative assessment through related examination. Experiments within the Advanced synthesis practical; summative assessment of the writing of journal-style synthetic protocols and interpretation and presentation of spectroscopic data building on		Working on practical experiments individually, in pairs, and in small groups. Implicit assessment through summative assessment through laboratory reports.	

Stage 2	Core 4b: Theory, Analysis & Mechanisms	Progress towards PLO	Developing an understanding of inorganic, physical and analytical chemistry at an intermediate level.		Develop intermediate skills required for synthetic inorganic and organic chemistry including handling air and water-sensitive materials and pyrophorics. Working safely in the laboratory.	Development of key mathematical skills and data analysis	Development of written and oral presentation skills.		Developing professional modes of behaviour, with respect to sharing resources, learning and adhering to standard laboratory practice, and working well with others	

		By working on (and if applicable, assessed through)	Engaging with lectures and learning support activities on Mass Spectrometry, Quantum Mechanics, Symmetry and Group Theory, Metal-ligand Bonding & Inorganic Mechanisms, Matrices & Determinants. Applications to unseen problems in tutorial and workshops.		Experiments within the Advanced synthesis practical. Core and advanced laboratory skills are formatively assessed during the Skills exercise then summatively assessed on a weekly basis principally through in-lab assessments during the second half of term.	Analysis of data within Advanced synthesis practical esp. spectral data inc. NMR. Formative assessment through Skills training and optional post-lab tasks. Summative assessment through selected assessed post-lab tasks. Matrices and Determinants course; formative assessment through workshops and summative assessment through final assessed workshop.	Preparation of written tutorial and workshop exercises. Engagement in tutorials and workshops. Formative assessment of articulation of intermediate scientific concepts in writing and oral presentation. Experiments within the Advanced synthesis practical; summative assessment of written descriptions of key laboratory techniques and NMR data presentation; optional formative tasks in writing of journal-style synthetic protocols and		Working on practical experiments individually, in pairs, and in small groups. Implicit assessment through summative assessment through laboratory reports.	

Stage 2	Core 5: Reactivity	Progress towards PLO	Developing an understanding at intermediate level of key methods for structural analysis and their physical basis, and the reactivity of organic molecules dependent on substitution patterns and complexation to metals.		Record experimental data. Use simulation software to aid experimental design.	Data analysis	Development of written and oral presentation skills.		Developing professional modes of behaviour, with respect to sharing resources, learning and adhering to standard laboratory practice, and working well with others. Team working and presentations in a business context. Commercial awareness and creativity in chemical solutions to real-world business exercises.	

		By working on (and if applicable, assessed through)	Engaging with lectures and learning support activities on Organometallic chemistry, Physical organic chemistry, Heteroaromatic Chemistry, Synthesis of biological molecules, Physical methods for structure determination and Electrochemistry. Applications to unseen problems in tutorial and workshops. Formative assessment is through small-group tutorial/worksho p assignments in each topic and summative assessment through an open-book assessment (Physical		Physical organic chemistry laboratory and related Hammett Lab software simulation. Summative assessment by written report of the use of Hammett Lab simulation to model substituent effects on the rate of reaction.	Physical organic chemistry laboratory. Analysis of reaction mechanism by exploration of reaction kinetics including introduction to non-linear regression analysis. Summative assessment through lab reports. Formative assessment through related tutorial problem-solving activities.	Preparation of written tutorial and workshop exercises. Engagement in tutorials and workshops. Formative assessment of articulation of intermediate scientific concepts in writing and oral presentation. Physical organic chemistry laboratory; summatively assessed long-format laboratory reports building on report-writing of Physical practicals (Core 6). Presentation skills formatively assessed in first Group Exercise team presentation (video recorded) and summatively		Working on practical experiments individually, in pairs, and in small groups. Implicit assessment through summative assessment through laboratory reports. Working on problems through the Group Exercise including peer assessment of teamwork in industrially-derived case studies. Teamwork, commercial awareness and creativity and communication skills summatively assessed though team minutes, executive summary and	

Stage 2	Core 6: Spectroscopy & Chemistry	Progress towards PLO	Developing an understanding at intermediate level of key spectroscopic techniques and their orbital interpretation with applications in organic chemistry and catalysis.		Design and perform experiments	Data analysis	Development of written and oral presentation skills.		Developing professional modes of behaviour, with respect to sharing resources, learning and adhering to standard laboratory practice, and working well with others	

		By working on (and if applicable, assessed through)	Engaging with lectures and learning support activities on Excited states and photochemistry, Applications of NMR spectroscopy in organic chemistry, Photoelectron spectroscopy and molecular orbital theory, Vibrational spectroscopy, Catalysis, Fundamentals of Atmospheric Chemistry, and Fundamentals of Magnetic Resonance. Applications to unseen problems in tutorial and workshops. Formative assessment is through small-group tutorial/worksho		Physical chemistry practical	Physical chemistry practical including use of specialist software (Gaussian); self-guided study package with summative assessment via calculation of optimised molecular structures and their characteristic vibrational frequencies	Preparation of written tutorial and workshop exercises. Engagement in tutorials and workshops. Formative assessment of articulation of intermediate scientific concepts in writing and oral presentation. Physical chemistry practical; summatively assessed short- and long-format laboratory reports, the latter building on formative report-writing skills session.		Working on practical experiments individually, in pairs, and in small groups. Implicit assessment through summative assessment through laboratory reports.	

Stage 2	The Material World: Chemistry & Applications	Progress towards PLO		Applying learning skills and core chemical principles to gaining a detailed knowledge of a chemical science specialism and applications in problem solving			Development of written and problem-solving skills		Commercial awareness and creative solutions in the sciences	

		By working on (and if applicable, assessed through)		Engaging with lectures and learning support activities on Introduction to Materials Science, Structural Organisation and Self-assembly in Macromolecular Soft Materials including Nematic Liquid Crystals in Modern Displays, Inorganic Nanoparticles, Designer Polymers and Organic-Inorganic Hybrid Materials. Applications to unseen problems in workshops. Formative activities through workshop assignments and summative assessment is through an assessed workshop			Learning support workshops; formative assessment through supported workshop activities with summative assessment of written work covering specialised chemical topics at an intermediate level through an assessed workshop and examination.		Application of chemistry to commercial materials applications through formative case studies and workshop activities.	

Stage 2	Green Chemistry and Sustainable Manufacturing	Progress towards PLO		Applying learning skills and core chemical principles to gaining a detailed knowledge of a chemical science specialism and applications in problem solving		Critical data analysis in the evaluation and comparison of chemical processes	Development of written, oral coomunication and problem-solving skills		Commercial awareness and creative solutions in the sciences. Group work.	

		By working on (and if applicable, assessed through)		Engaging with lectures and learning support activities on Principles & Metrics of Green Chemistry, Sustainable Reagents & Reactants, Sustainable Energy Sources, Sustainable Solvents, Sustainability beyond Green Chemistry. Applications to unseen problems and case studies in workshops. Formative activities include workshop assignments and case studies and summative assessment is through an assessed workshop (Principles/metrics) and a closed-book		Chemical case studies; analysis of key metrics of Green Chemistry and financial viability; formative assessment through workshop activities and summative assessment through assessed workshop.	Learning support workshops; formative assessment through supported workshop activities with summative assessment of written work covering specialised chemical topics at an intermediate level through an assessed workshop (group poster and poster session) and examination.		Application of green chemistry philosophy to commercial processes through formative case studies and workshop activities. Metrics including costs summatively assessed through assessed workshop (group poster and poster session).	

Stage 2	Dynamic Earth: Origins, Evolution, Biogeochemistry & Climate	Progress towards PLO		Applying learning skills and core chemical principles to gaining a detailed knowledge of a chemical science specialism and applications in problem solving		Data gathering and analysis; use of information resources	Development of written and problem-solving skills	Research skills in the field	Creative applications of analytical chemistry. Teamwork and peer evaluation skills.	

		By working on (and if applicable, assessed through)		Engaging with lectures and learning support activities on Elements & Minerals, The Geosphere, The Hydrosphere, Past Climate, Biogeochemistry & Climate and Archaeological Palaeoenvironments. Applications to unseen problems and case studies in workshops. Formative activities include workshop assignments, practical elements (rocks, & microscopy), field work and summative assessment is through an assessed wiki website and a closed-book examination (Summer).		Study of mineral and rock samples in formative practical activitiy; aspects of data analysis summatively assessed through wiki based on course content	Learning support workshops; formative assessment through supported workshop and practical activities with summative assessment of written work covering specialised chemical topics at an intermediate level through an assessed wiki assignment (involving peer evaulation of websites) and examination.	Geological fieldwork/site visit to geological exposures. Formative assessment through follow-up report.	Application of isotopes and other approaches to dating on geological timescales through formative case studies and workshop activities. Group activity in development and evaluation of a wiki website with implicit summative assessment of teamwork.	

Stage 2	Genes to Proteins	Progress towards PLO		Applying learning skills and core chemical principles to gaining a detailed knowledge of a chemical science specialism and applications in problem solving			Development of written and problem-solving skills		Commercial awareness and creative solutions in the sciences	

		By working on (and if applicable, assessed through)		Engaging with lectures and learning support activities on Transcription & Control of Gene Expression, Protein Synthesis & DNA Replication, Genetic & Protein Engineering, Protein Structure, Determining Protein Structure and Proteins in Action. Applications to unseen problems and case studies in workshops. Formative activities include workshop assignments and summative assessment is through two assessed workshops (Genetic/Protein engineering &			Learning support workshops; formative assessment through supported workshop activities with summative assessment of written work covering specialised chemical topics at an intermediate level through an assessed workshops and examination.		Application of genetic and protein engineering to commercial activities in industrial/medicinal production through formative case studies and workshop activities, and summative assessment through assessed workshops.	
Stage 3	Core 7: Advanced Concepts	Progress towards PLO	Understanding high-level chemical principles across physical, theoretical and organic chemistry.				Development of written and oral presentation skills		Commercial applications of cutting-edge chemistry; creativity in research and applications	

		By working on (and if applicable, assessed through)	Engaging with lectures and learning support activities on Bioinorganic Chemistry, Electronic States of Atoms & Molecules, Statistical Thermodynamics, Applications of Quantum Chemistry, Pericyclic Reactions and Supramolecular & Nanoscale Chemistry. Applications to unseen problems in tutorial and workshops. Formative assessment is through small-group tutorial/workshop and computer-based assignments in each topic and summative assessment				Preparation of written tutorial and workshop exercises. Engagement in tutorials and workshops. Formative assessment of articulation of complex scientific concepts in writing and oral presentation.		Application of Supramolecular chemistry to commercial activities in industrial/medicinal chemistry through formative case studies and workshop activities. Introduction to research topics through lectures and formative case studies and workshop activities.	
Stage 3	Core 8: Synthesis & Structures	Progress towards PLO	Understanding high-level chemical principles across the organic-inorganic chemistry interface.				Development of written and oral presentation skills		Commercial applications of cutting-edge chemistry; creativity in research and applications	

		By working on (and if applicable, assessed through)	Engaging with lectures and learning support activities on Main Group Chemistry: Bonding & Applications, Synthetic Frontiers of Inorganic Chemistry & Ligand Design, Metal-Mediated Synthesis, Asymmetric Synthesis, Radicals in Synthesis and Advanced Separations & Mass Spectrometry. Applications to unseen problems in tutorial and workshops. Formative assessment is through small-group tutorial/worksho p assignments in each topic and summative				Preparation of written tutorial and workshop exercises. Engagement in tutorials and workshops. Formative assessment of articulation of complex scientific concepts in writing and oral presentation.		Application of Main Group chemistry to modern materials through formative case studies and workshop activities. Introduction to research topics through lectures and formative case studies and workshop activities.	
Stage 3	Core 9: Compounds & Materials	Progress towards PLO	Understanding high-level chemical principles across physical and materials chemistry.				Development of written and oral presentation skills		Commercial applications of cutting-edge chemistry; creativity in research and applications	

		By working on (and if applicable, assessed through)	Engaging with lectures and learning support activities on Processes at Solid Surfaces, Principles of Diffraction, Electronic Properties of Materials, f-block chemistry, Materials & Nanoparticles and Electronic Spectra & Photochemistry of Transition Metals. Applications to unseen problems in tutorial and workshops. Formative assessment is through small-group tutorial/workshop assignments in each topic and summative assessment through a closed-book				Preparation of written tutorial and workshop exercises. Engagement in tutorials and workshops. Formative assessment of articulation of complex scientific concepts in writing and oral presentation.		Application of materials and nanochemistry to commercial activities in device and advanced materials technology through formative case studies and workshop activities. Introduction to research topics through lectures and formative case studies and workshop activities.	
Stage 3	Advanced Practical Research Training	Progress towards PLO			Experimental design and implementation	Data interpretation and analysis	Written scientific project reports and posters	Design and implement a research project	Team working towards a research goal, creative solutions in research	

		By working on (and if applicable, assessed through)			Advanced experiments and miniprojects	Advanced experiments in inorganic, physical and organic chemistry. Data obtained from the miniprojects. Summative assessment through extended reports building on Stage 2 report writing.	Lab reports for four advanced experiments and the group miniproject; the latter also includes production of a research poster by the group. All are summatively assessed.	Team miniproject - groups of 3-6 students tackle an open-ended problem with scope to design their own investigation on the basis of literature and their own ideas and in collaboration with a supervisor. Students take the lead with planning, risk assessing and evolving the project. Summative assessment through individual reports (covering the whole group's work) and a group poster.	Team miniproject involving teamwork in a research setting including planning, prioritisation, sharing of workload and interpersonal communication. Outcomes are implicitly assessed through the summative assessment of overall productivity (report) and team presentation (group poster). Implicit summative assessment of creative strategy in research and presentation thereof.	

Stage 3	Reaction Intermediates & Mechanisms	Progress towards PLO		Applying learning skills and core chemical principles to gaining a detailed knowledge of a chemical science specialism and applications in problem solving			Development of written and problem-solving skills		Commercial applications of cutting-edge chemistry; creativity in research and applications	

		By working on (and if applicable, assessed through)		Engaging with lectures and learning support activities on Organic Intermediates in Synthesis & Biology, Interrogation of Mechanism in Organometallic Chemistry, NMR Studies of Reaction Intermediates & Mechanism, Mechanistic Studies with EPR Spectroscopy, and Time-Resolved Spectroscopy for the Study of Fast Reactions. Applications to unseen problems and case studies in workshops. Formative assessment is through workshop assignments and summative			Learning support workshops; formative assessment through supported workshop activities with summative assessment of written work covering complex, specialised chemical topics through an assessed workshop and examination.		Application of organometallic chemistry and spectroscopy to commercial production routes through formative case studies and workshop activities. Introduction to research topics through lectures and formative case studies and workshop activities.	

Stage 3	Catalysis wth Green Technologies	Progress towards PLO		Applying learning skills and core chemical principles to gaining a detailed knowledge of a chemical science specialism and applications in problem solving			Development of written and problem-solving skills		Commercial applications of cutting-edge green chemistry and sustainable technology; creativity in research and applications	

		By working on (and if applicable, assessed through)		Engaging with lectures and learning support activities on Heterogeneous Catalysis, Homogeneous Catalysis by Transition Metal Compounds, Asymmetric Catalysis, Enzymatic Catalysis, Catalysis with Sustainable Metals and Green Catalytic Technologies. Applications to unseen problems and case studies in workshops. Formative activities include workshop assignments and summative assessment is through a MCQ assessment (Sustainable Catalysis) and a closed-book			Learning support workshops; formative assessment through supported workshop activities with summative assessment of written work covering complex, specialised chemical topics through an MCQ assessment and examination.		Application of green catalytic technologies including biocatalysis to commercial activities in production technology through formative case studies and workshop activities. Introduction to research topics through lectures and formative case studies and workshop activities. Summative assessment of aspects of commercial awareness through assessed workshop and exam.	

Stage 3	Atmospheric Chemistry	Progress towards PLO		Applying learning skills and core chemical principles to gaining a detailed knowledge of a chemical science specialism and applications in problem solving		Critical data analysis	Development of written and problem-solving skills		Applications of cutting-edge chemistry; creativity in research and implications for policy	

		By working on (and if applicable, assessed through)		Engaging with lectures and learning support activities on Meteorology & Physical Climate, Chemistry of Gases in the Troposphere & Stratosphere, Modelling Techniques, Measurement Techniques and Science into Health & Policy. Applications to unseen problems and case studies in workshops. Formative activities include workshop assignments and summative assessment is through a computer-based simulation workshop and report (Modelling Techniques) and a closed-book examination [illegible]		Report on air quality in cities; application of computer modelling; summative assessment through a computer-based simulation workshop and report (Modelling Techniques)	Learning support workshops; formative assessment through supported workshop activities with summative assessment of written work covering complex, specialised chemical topics through an assessed report based on computer modelling and examination.		Application of atmospheric research (through measurement and modelling) to policy-making through formative case studies and workshop activities. Introduction to research topics through lectures and formative case studies and workshop activities. Summative assessment of modelling of pollution in cities on aspects of policy through assessed workshop.	

Stage 3	Chemistry & Disease	Progress towards PLO		Applying learning skills and core chemical principles to gaining a detailed knowledge of a chemical science specialism and applications in problem solving		Understanding the role of computers in chemistry	Development of written and problem-solving skills		Applications of cutting-edge chemistry; creativity in research and implications for future affordable and effective treatments	

		By working on (and if applicable, assessed through)		Engaging with lectures and learning support activities on Introduction to Chemotherapy, Drug Metabolism & Delivery, Introduction to the Molecular Basis of Disease, Cancer Chemotherapy, Molecular Aspects of Complex Diseases, Modern Approaches to Drug Discovery and Metals in Medicine. Applications to unseen problems and case studies in workshops. Formative activities include workshop assignments and summative assessment is through a computer-based		Molecular graphics workshop; summative assessment through a computer-based workshop using software to visualise active site-drug interactions and related report (Modern Approaches to Drug Discovery)	Learning support workshops; formative assessment through supported workshop activities with summative assessment of written work covering complex, specialised chemical topics through an assessed report based on modelling/molecular graphics software and examination.		Application of research at the interface of biological and medicinal chemistry to current and future therapies through formative case studies and workshop activities. Introduction to research topics through lectures and formative case studies and workshop activities. Summative assessment of modelling of molecular interactions on drug design through assessed workshop.	

Stage 3	Synthesis - From Nature to the Lab	Progress towards PLO		Applying learning skills and core chemical principles to gaining a detailed knowledge at M-level of a chemical science specialism and applications in problem solving			Development of written and problem-solving skills		Applications of cutting-edge chemistry; creativity in research	

		By working on (and if applicable, assessed through)		Engaging with lectures and learning support activities on Advanced Organic Synthesis, Biosynthesis of Polyketides, Terpenes and Alkaloids, Advanced Retrosynthesis, Stereocontrolled Synthesis using Organo-Main Group Chemistry and Synthesis of Nitrogen-containing Pharmaceuticals and Natural Products. Applications to unseen problems and case studies in workshops. Formative activities include workshop assignments and a problems class and summative assessment is			Learning support workshops; formative assessment through supported workshop activities and a problems class with summative assessment of written work covering leading-edge, specialised chemical topics and current research literature through an assessed workshop and examination.		Application of research at the interface of biological and synthetic chemistry to development of creative and cost-effective synthetic strategies through formative case studies and workshop activities. Introduction to research topics through lectures and formative case studies and workshop activities. Implicit summative of assessment creativity in synthetic strategy through exam.	

Stage 3	Chemical Biology & Molecular Interactions	Progress towards PLO		Applying learning skills and core chemical principles to gaining a detailed knowledge at M-level of a chemical science specialism and applications in problem solving		Understanding the role of computers and spectroscopy in biological chemistry	Development of written and problem-solving skills		Applications of cutting-edge chemistry; creativity in research	

		By working on (and if applicable, assessed through)		Engaging with lectures and learning support activities on Current Topics in Molecular and Cell Biology, Modern Methods of Probing Biological Interactions and Chemical Biology. Applications to unseen problems and case studies in workshops. Formative activities include a molecular graphics workshop and summative assessment is through an assessed activity involving a workshop and follow-up written exercise based on a selection of scientific papers (Proteins in Chemical Biology) and a closed-		Molecular graphics workshop (formative) for probing molecular interactions; data analysis/interpretation of advanced spectroscopic techniques including NMR, crystallography and calorimetry; summative assessment through examination	Learning support workshops; formative assessment through supported workshop activities including molecular graphics software with summative assessment of written work covering leading-edge, specialised chemical topics and current research literature through an assessment based on a review of scientific papers and examination.		Application of chemistry techniques to research in cellular processes and current topics in chemical biology. Creative experimental design through formative case studies and workshop activities. Introduction to research topics through lectures and formative case studies and workshop activities. Implicit summative assessment through exam.	

Stage 3	Chemical Theory & Computation	Progress towards PLO		Applying learning skills and core chemical principles to gaining a detailed knowledge at M-level of a chemical science specialism and applications in problem solving		Understanding the role of computers in chemistry	Development of written and problem-solving skills		Applications of cutting-edge theoretical and computational chemistry; creativity in research	

		By working on (and if applicable, assessed through)		Engaging with lectures and learning support activities on Solubility and Solvent Design, Computer Simulation of Molecular Systems and Quantum Chemical Calculations. Applications to unseen problems and case studies in workshops. Formative activities include computer-based workshop assignments and summative assessment is through an assessed workshop and a closed-book examination (Summer).		Computer-based simulations and quantum-chemical calculations/modelling through three formative workshop assignments and a single summatively assessed workshop.	Learning support workshops; formative assessment through supported workshop and computer-based activities with summative assessment of written work covering leading-edge, specialised chemical topics and current research literature through an assessed workshop and examination.		Application of theoretical and computational techniques to research and industrial commercial applications. Creative experimental design through formative case studies and workshop activities. Introduction to research topics through lectures and formative case studies and workshop activities. Implicit summative assessment through exam.	

Stage 3	Analytical & Forensic Chemistry	Progress towards PLO		Applying learning skills and core chemical principles to gaining a detailed knowledge at M-level of a chemical science specialism and applications in problem solving			Development of written and problem-solving skills		Applications of cutting-edge analytical chemistry; creativity in research	

		By working on (and if applicable, assessed through)		Engaging with lectures and learning support activities on Multidimensional Chromatography with Mass-Selective Detection, Forensics & the Environment, Applications to Forensic Science and New Directions in Analytical & Forensic Chemistry. Applications to unseen problems and case studies in workshops. Formative activities include workshop assignments and summative assessment is through an assessed workshop and a closed-book examination (Summer).			Learning support workshops; formative assessment through supported workshop activities and case studies with summative assessment of written work covering leading-edge, specialised chemical topics and current research literature through an assessed workshop and examination.		Application of analytical techniques to the study of biological, medical, environmental and pharmaceutical sciences. Creative experimental design through formative case studies and workshop activities. Introduction to research topics through lectures and formative case studies and workshop activities. Implicit summative assessment through exam.	

Stage 3	Bioinspired Chemistry	Progress towards PLO		Applying learning skills and core chemical principles to gaining a detailed knowledge at M-level of a chemical science specialism and applications in problem solving			Development of written and problem-solving skills		Applications of biomimetic chemistry to catalysis and materials; creativity in research	

		By working on (and if applicable, assessed through)		Engaging with lectures and learning support activities on Bioinorganic Model Complexes I & II, Biological Inspiration in Materials Science and Bioinspired Solutions for Sustainable Chemistry. Applications to unseen problems and case studies in workshops. Formative activities include workshop assignments and summative assessment is through an assessed workshop involving scientific paper comprehension (Bioinorganic Model Complexes) and a closed-book			Learning support workshops; formative assessment through supported workshop activities with summative assessment of written work covering leading-edge, specialised chemical topics and current research literature through an assessed workshop based on paper comprehension and examination.		Application of biomimetic approaches to the development of green chemical production processes and novel materials. Creative experimental design through formative case studies and workshop activities. Introduction to research topics through lectures and formative case studies and workshop activities. Implicit summative assessment through exam.	

Stage 3	Lasers in Chemistry	Progress towards PLO		Applying learning skills and core chemical principles to gaining a detailed knowledge at M-level of a chemical science specialism and applications in problem solving			Development of written and problem-solving skills		Applications of lasers in chemistry/spectroscopy; creativity in research	

		By working on (and if applicable, assessed through)		Engaging with lectures and learning support activities on Introduction to Lasers, Lasers in Frequency Domain Spectroscopy and Lasers in the Time-Domain: Reaction Dynamics. Applications to unseen problems and case studies in workshops. Formative activities include workshop assignments and summative assessment is through an assessed workshop and a closed-book examination (Summer).			Learning support workshops; formative assessment through supported workshop activities with summative assessment of written work covering leading-edge, specialised chemical topics and current research literature through an assessed workshop and examination.		Application of lasers in high resolution and time-dependent spectroscopy. Creative experimental design through formative case studies and workshop activities. Introduction to research topics through lectures and formative case studies and workshop activities. Implicit summative assessment through exam.	
Stage 4	MChem Advanced Research Project	Progress towards PLO		Fundamental investigation of specific chemical principles	Design laboratory experiments and carrying out risk assessments. Documenting work through a lab book.	Masters-level data interpretation and analysis	Oral and written presentation skills	Plan, design and conduct an independent open ended investigative research project	Problem solving, time management and team working during research projects. Creativity in research.	

		By working on (and if applicable, assessed through)		M-level research including literature comprehension. Formative research and laboratory experiences are guided by the supervisor and other research group members. Formative assessment of a project report draft and practice presentations. Summative assessment by final project report (40%), supervisor's project execution mark (35%) and oral presentation/exam (25%).	Research Project. Collaboration with project supervisor and research group encourages development of increasingly independent approaches to safe working and the design and interpretation of experiments. Summatively assessed though the written report and the supervisor's project execution mark (35% of module).	Research Project. Collaboration with project supervisor and research group encourages development of skills in data analysis. Summatively assessed though the written report (40% of module).	Research project report and oral presentation	Research Project. Students experience an extended, independent project experience within a research group with the potential to produce publishable research for chemistry and related journals. Formative experience is provided through introductory courses (literature, safety, planning etc.) and through support within research groups and supervision. Summative assessment is achieved through assessment of the project by report and oral examination, and through the	Research Project. Students experience an extended, independent project experience within a research group involving engagement with planning, time management, teamwork and interpersonal communication with a range of Departmental staff and co-workers. Formative feedback available through academic supervision with summative assessment of outcomes implicitly assessed through overall productivity (report/oral, 40% /25%) and execution (35%).	
Stage 4	Literature Review	Progress towards PLO		Researching a project-related literature topic		Collating, interpreting and presenting results from the chemical literature	Preparing a well-presented report using ChemDraw and related software.			

		By working on (and if applicable, assessed through)		Literature gathering, analysis and interpretation. Formative workshop on the use of search engines; commentary on draft literature review document. Summative assessment through final written literature review (2500-3000 words).		Writing a literature report; formative elements include a workshop on using the research literature and databases and commentary on a draft of the literature reivew by the project supervisor. The final literature review is summatively assessed.	Writing a literature review at a level consistent with published materials. Commentary on a draft of the literature reivew by the project supervisor before the final literature review is summatively assessed.			
Stage 4	Core 10: Advanced Chemistry	Progress towards PLO		Applying learning skills and core chemical principles to gaining a detailed knowledge at M-level of a chemical science specialism and applications in problem solving					Develop approaches to lifelong & workplace learning for CPD; identifying specific learning needs	

		By working on (and if applicable, assessed through)		Advanced distance learning topics in (three from) Inorganic Chemistry; Materials Chemistry; Organic Chemistry; Physical / Analytical Chemistry. Formative assessments through online tools/quizzes. Summative assessment through closed-book exam (Summer).					Engage with distance learning packages covering interdisciplinary modern chemical research in preparation for summative examination. Distance learning materials contain formative assessment points through suitable VLE quizzes etc.	

Overview of modules by stage

Notes:

[1] The credit level is an indication of the module's relative intellectual demand, complexity and depth of learning and of learner autonomy (Level 4/Certificate, Level 5/Intermediate, Level 6/Honours, Level 7/Masters)

[2] The credit value gives the notional workload for the module, where 1 credit corresponds to a notional workload of 10 hours (including contact hours, private study and assessment)

[3] Special assessment rules (requiring University Teaching Committee approval); P/F – the module marked on a pass/ fail basis (NB pass/ fail modules cannot be compensated); NC – the module cannot be compensated; NR – there is no reassessment opportunity for this module. It

[4] Independent Study Modules (ISMs) are assessed by a dissertation or substantial project report. They cannot be compensated (NC) and are subject to reassessment rules which differ from 'taught modules'. Integrated Masters programmes may designate a project in the final stage

Core & option module table (add additional rows as required)

Stage	Core/ Option	New/	Module title	Module code	Credit	Credit	Prerequisites,	Assessment rules[3],[4]	Timing of module (eg. AuT – Autumn, SpT –	Format, contribution to
1	Core	Yes	Core 1: Fundamentals of Chemistry	CHE00015C	4	30			AuT	85% exam SpT and 15% workshop AuT
1	Core	Yes	Core 2: Chemical Properties and Analysis	CHE00016C	4	30	Core 1		SpT, SuT	85% exam SuT and 15% workshop SpT
1	Core	Yes	Core 3: Molecules and Reactions	CHE00017C	4	30	Core 1	The assessed component of the self-study course (Macromolecules) is a short video or an article which would be impractical to reassess and will not be of value for the students.	SpT, SuT	85% exam SuT and 15% tutorial SuT (Macromolecules)
1	Core	Yes	Skills for Chemists	CHE00019C	4	10		A diagnostic assessment of maths skills is required (Wk2 AuT) as the students need a certain level in maths in order to cope with the Chemistry course. The pass threshold corresponds to the lowest acceptable level. The Department will provide support to failing students throughout the first term to help bring them to the required level tested through re-assessment (Wk9 AuT). The questions for the test will be drawn from a bank of questions so that the test can be repeated several times, if required. The 'no reassessment' part is assessed via presentations for which reassessment would be very impractical and of doubtful value.	Year Long	30% exam SpT, 30% group presentation AuT, 40% exam SuT

1	Core	Yes	Practical Chemistry	CHE00018C	4	20		The module is not marked on a PASS/FAIL basis, but it contains, in addition to the credit-bearing elements, a single P/F assessment, which assesses each student's ability to work safely in the chemistry laboratory. This is crucial for the practical work which follows in subsequent years, and therefore merits a P/F assessment. For students who fail this assessment at the first opportunity, special measures will be deployed, including retraining, closer supervision and multiple opportunities to retake the assessment during the Spring and Summer terms. The 'no reassessment' components are laboratory experiments. It is impractical to put in place reassessment of this work although it may be possible to set a reassessment of part of the laboratory write-up involving sample data sets. However, this would not in any sense correctly reflect the competence of the student to carry out practical chemistry, a component that lies at the heart of undergraduate chemistry training and which constitutes a major part of the Royal Society of Chemistry accreditation process.	Year Long	P/F skills test AuT, 45% skills tests SpT, 5% coursework SpT (lab book), 25% practicals SuT (Physical Chem.), 25% practicals SuT (ICP)
2	Core	Yes	Core 4a: Molecules in Action	CHE00016I	5	20	Chemistry Stage 1 modules	Safety Pass/Fail assessment can be repeated unlimited number of times until a Pass mark is achieved. The 'no reassessment' components are laboratory practical. It is completely impractical to put in place reassessment of laboratory work although it may be possible to set a reassessment of part of the laboratory write-up involving sample data sets. However, this would not in any sense correctly reflect the competence of the student to carry out practical chemistry, a component that lies at the heart of undergraduate chemistry training and which constitutes a major part of the Royal Society of Chemistry accreditation process.	AuT	80 %exam SpT, 20% practicals AuT
2	Core	Yes	Core 4b: Theory, Analysis and Mechanisms	CHE00017I	5	20	Chemistry Stage 1 modules	The 'no reassessment' components are laboratory practical. It is completely impractical to put in place reassessment of laboratory work although it may be possible to set a reassessment of part of the laboratory write-up involving sample data sets. However, this would not in any sense correctly reflect the competence of the student to carry out practical chemistry, a component that lies at the heart of undergraduate chemistry training and which constitutes a major part of the Royal Society of Chemistry accreditation process.	AuT	80% exam SpT, 12.5% practicals AuT, 7.5% workshop AuT

2	Core	Yes	Core 5: Reactivity	CHE00018I	5	30	Autumn term Chemistry stage 2 modules	The 'no reassessment' components are assessed by presentation (reassessment would be very impractical and of doubtful value) or are a laboratory practical. It is completely impractical to put in place reassessment of laboratory work although it may be possible to set a reassessment of part of the laboratory write-up involving sample data sets. However, this would not in any sense correctly reflect the competence of the student to carry out practical chemistry, a component that lies at the heart of undergraduate chemistry training and which constitutes a major part of the Royal Society of Chemistry accreditation process.	SpT, SuT	70% exam SuT, 10% practicals SpT SuT, 11.67% workshop SuT, 8.33% presentation SuT
2	Core	Yes	Core 6: Spectroscopy and Chemistry	CHE00019I	5	30	Autumn term Chemistry stage 2 modules	The 'no reassessment' components are assessed by a laboratory practical. It is completely impractical to put in place reassessment of laboratory work although it may be possible to set a reassessment of part of the laboratory write-up involving sample data sets. However, this would not in any sense correctly reflect the competence of the student to carry out practical chemistry, a component that lies at the heart of undergraduate chemistry training and which constitutes a major part of the Royal Society of Chemistry accreditation process.	SpT, SuT	55% exam SuT, 30% practicals SpT, 15% workshop SuT
2	Option	Yes	The Material World: Chemistry and Applications (MW)	CHE00023I	5	20	Chemistry Stage 1 Modules, or by special permission of module coordinator		SpT, SuT	80% exam SuT, 20% workshop SpT
2	Option	Yes	Green Chemistry and Sustainable Manufacturing (SM)	CHE00024I	5	20	Chemistry Stage 1 Modules, or by special permission of module coordinator	The 'no reassessment' component is an assessed poster session incorporating group work and individual mark components. It is completely impractical	SpT, SuT	80% exam SuT, 20% poster assessment SpT
2	Option	Yes	Dynamic Earth: Origins, Evolution, Biogeochemistry and Climate (DE)	CHE00020I	5	20	Chemistry Stage 1 Modules, or by special permission of module coordinator		SpT, SuT	80% exam SuT, 20% assessed wiki SuT
2	Option	Yes	Genes to Proteins (GP)	CHE00021I	5	20	Chemistry Stage 1 Modules, or by special permission of module coordinator		SpT, SuT	80% exam SuT, 20% workshop SpT
3	Core	Yes	Core 7: Advanced Concepts	CHE00026H	6	20	Chemistry Stage 2 modules		Year Long	85% exam SuT, 15% workshops SpT
3	Core	Yes	Core 8: Synthesis & Structures	CHE00027H	6	20	Chemistry Stage 2 modules		Year Long	85% exam SuT, 15% workshops SpT
3	Core	Yes	Core 9: Compounds & Materials	CHE00028H	6	20	Chemistry Stage 2 modules		Year Long	100% exam SuT
3	Option	Yes	Reaction Intermediates and Mechanisms (RI)	CHE00029H	6	20	Chemistry Stage 2 modules, or by special permission of Module Coordinator		AuT	80% exam SpT, 20% workshop AuT
3	Option	Yes	Catalysis with Green Technologies (CGT)	CHE00032H	6	20	Chemistry Stage 2 modules, or by special permission of Module Coordinator		AuT	80% exam SpT, 20% workshop AuT

3	Option	Yes	Atmospheric Chemistry (AC)	CHE00031H	6	20	Chemistry Stage 2 modules, or by special permission of Module Coordinator		AuT	80% exam SpT, 20% workshop AuT
3	Option	Yes	Chemistry and Disease (CD)	CHE00030H	6	20	Chemistry Stage 2 modules, or by special permission of Module Coordinator		AuT	80% exam SpT, 20% workshop AuT
3	Core	Yes	Advanced Practical Research Training	CHE00005H	6	20	Chemistry Stage 1 and 2 Core Modules.	We view it as inappropriate to reassess laboratory work because any reassessment would not provide a properly representative assessment of the practical skills of the student nor their development during extended periods of practical chemistry courses. It also fails to properly document their commitment to practical chemistry, a component that lies at the heart of undergraduate chemistry training and which constitutes a major part of the Royal Society of Chemistry accreditation process. In addition it would be time-consuming, expensive to resource and challenging to organise reassessments for every practical component that we run across the four years of the course. In order to minimise the potential impact of such a policy, we propose to follow closely the development and performance of all students across each of their practical courses and to define regular check points to ensure that each student is maintaining an adequate level of performance. For special cases, where a student may miss the bulk of or all of a practical course through no fault of their own, we would devise a resit task to be taken during the August resit period. However, this would be the exception rather than the rule and organised on an ad hoc basis. The MChem mini-projects can be reassessed by a resubmission of the report, but only if the student has successfully completed the practical	Year Long	30% practicals AuT, 50% miniproject report/group poster SpT, 20% open book Int Spec exam SpT
3	Option	Yes	Synthesis – From Nature to the Lab (SY)	CHE00034M	7	10	Core modules in chemistry stage 1-3, or by special permission of module coordinator.		SpT, SuT	70% exam SuT, 30% workshop SpT
3	Option	Yes	Chemical and Synthetic Biology (CB)	CHE00037M	7	10	Core modules in chemistry stage 1-3, or by special permission of module coordinator.		SpT, SuT	70% exam SuT, 30% workshop SuT
3	Option	Yes	Chemical Theory and Computation (CTC)	CHE00032M	7	10	Core modules in chemistry stage 1-3, or by special permission of module coordinator.		SpT, SuT	70% exam SuT, 30% workshop SuT

3	Option	Yes	Analytical and Forensic Chemistry (AF)	CHE00035M	7	10	Core modules in chemistry stage 1-3, or by special permission of module coordinator. The course is also appropriate for biochemists.		SpT, SuT	70% exam SuT, 30% workshop SuT
3	Option	Yes	Bioinspired Chemistry (BI)	CHE00033M	7	10	Core modules in chemistry stage 1-3, or by special permission of module coordinator. The course is also appropriate for biochemists.		SpT, SuT	70% exam SuT, 30% workshop SpT
3	Option	Yes	Lasers in Chemistry (LC)	CHE00036M	7	10	Core modules in chemistry stage 1-3, or by special permission of module coordinator.		SpT, SuT	70% exam SuT, 30% workshop SpT
4	Core	No	Advanced Research Project	CHE00015M, CH	7	90	Chemistry Stage 3 Core Modules.	Reassessment of the project will be limited to a resubmission of the report. It is impossible to reassess performance in the laboratory for an Advanced Research Project and impractical to reassess presentations/viva exams.	Year Long	35% project assessment SuT, 40% project report SuT, 25% oral viva SuT
4	Core	No	Literature Review Skills	CHE00011M	7	10	Chemistry Stage 3 Core Modules.	NR	Year Long	100% report SuT
4	Core	Yes	Core 10: Advanced Chemistry		7	20	Chemistry Stage 3 Core Modules.		Year Long	100% exam SuT