Jesus College, Oxford

Subject Notes:
CHEMISTRY

Chemistry at Jesus College

Amongst the Oxford Colleges, Jesus has a particularly strong reputation in Chemistry, with our students achieving well above the average at both College and University level. Each year, the College seeks to admit 8-10 undergraduates to read Chemistry, making it one of the larger subject families at Jesus.

The College has three Tutorial Fellows in Chemistry, who are responsible for teaching in Inorganic, Organic and Physical Chemistry. The Tutorial Fellows also hold University appointments, and carry out research in the Department of Chemistry. Undergraduates admitted to read Chemistry at Jesus receive most of their individual College tuition from these tutors.

In addition to the Fellows and undergraduates, the College also features a sizeable population of graduate chemists, who are engaged in DPhil research in the Chemistry department. Together, our chemists are exposed to a breadth of experiences, for example through research seminars and subject social events throughout the year, in addition to regular tutorials.

In short, the study of Chemistry at Jesus College represents a fulfilling and exciting degree course, and provides an unparalleled range of opportunities to explore the subject, including dedicated expert tuition in all three of its branches. The tutors aim to provide an enjoyable but challenging environment to maximise the potential of our students, and above all to enthuse the Jesus chemistry community with their passion for the subject.

Academic Staff – The Tutorial Fellows

Professor Mark Brouard is the Tutor in Physical Chemistry, and the current Head of the Department of Chemistry. His research interests lie in the area of gas phase reaction dynamics and photochemistry, and imaging mass spectrometry. For more details, see: http://brouard.chem.ox.ac.uk/index.html

Professor Edward Anderson is the Tutor in Organic Chemistry. His research interests lie in the development and application of catalytic reactions and new synthetic methods in organic synthesis, as well as the synthesis of bioactive molecules. For more details, see: http://anderson.chem.ox.ac.uk

Professor Kylie Vincent is the Tutor in Inorganic Chemistry. Her research interests lie in understanding biological redox catalysis, and the development of new catalytic systems employing enzymatic transformations. For more details, see: http://vincent.chem.ox.ac.uk

Dr Alice Bowen also tutors in Physical Chemistry, providing tutorial support for Prof Brouard. Her research interests lie in electron paramagnetic resonance spectroscopy.

Chemistry at Oxford

Chemistry at Jesus fits into the wider umbrella of the subject at University level. The Oxford Chemistry Department is an internationally-leading faculty with state-of-the-art research facilities. The 2014 Research Assessment Framework judged Oxford Chemistry to have the top research environment in the U.K., while the Royal Society of Chemistry reaffirmed its ‘excellent’ classification in the most recent Teaching Quality Audit. This combination of excellence in teaching and research, together with the College tutorial system, results in an education in Chemistry that is second to none in the U.K. – if not the world! More details about the department can be found at http://www.chem.ox.ac.uk/.
About the Undergraduate Course
(For full details, see: http://teaching.chem.ox.ac.uk/undergraduate-course-handbook.aspx)

Course summary: The Oxford Chemistry course is divided into three sections: The first (Preliminary, or ‘Prelim’) year, the second and third years (Part I), and the fourth year (Part II). The overall structure of the course can be summarised as follows:

• The full degree course lasts for four years.
• Years 1-3 comprise the lecture and tutorial based teaching, alongside training in practical chemistry.
• The fourth year is spent a full-time research year, which is a unique aspect of the Oxford course.

The course is very 'Chemistry-focused': it aims to provide a broad and deep understanding of the subject, equipping students to study any area of chemistry, as well as to move into cross-disciplinary research areas with a preparation second to none. The nature of the tutorial system and Part II year also develop many additional skills that are highly prized by employers in fields other than Chemistry.

Course content: For the first three years, the course involves a combination of lectures, practicals, tutorials, and some class-based teaching, with students mainly studying Physical, Organic and Inorganic Chemistry. Some aspects of Physics and Biology are also incorporated within the main course structure; however, no prior (A-level) knowledge in these subjects is assumed or required.

In the first year, students study Inorganic, Organic, and Physical Chemistry, and Mathematics. Topics and tutorials in the first year college cover basic principles of Chemistry, and provide a foundation of knowledge that will last students through the rest of the course.

In the second and third years of the course, undergraduates continue to study a broad range of ‘core’ topics in the three branches of Chemistry, which build on the foundations of the first year by applying principles to more complex scenarios, as well as meeting more advanced topics of structure and reactivity. These topics are designed to give as broad a chemical education as possible. In the third year, students also select a number of ‘option’ topics, which consist of more advanced material from each of the three branches of chemistry, as well as introducing exciting new topics at the interface between these core themes, and also other sciences.

Many undergraduates choose to augment their studies by taking a Supplementary Subject, which aims to extend the knowledge of students interested in a specialized field of Chemistry or a related subject. Examples include Aromatic and Heterocyclic Pharmaceutical Chemistry, Quantum Chemistry, and History and Philosophy of Science. Undertaking one of these subjects is by no means necessary or even desirable for everyone reading Chemistry.

The fourth year (or ‘Part II’) of the course consists solely of a research project carried out in one of the research groups in the Department of Chemistry. This year is arguably the highlight of the course, bringing together theoretical learning with practical training in a cutting-edge research environment, and most importantly teaching skills that will not only prepare students for graduate research (should they wish to pursue this), but also for many other careers. Although 4th year students no longer have tutorials in College, they continue to engage with the College through subject-based seminars and events, and informal contact with their tutors.

Teaching in Chemistry: Undergraduate teaching is shared between the Department of Chemistry (lectures, practical work, certain classes) and the College (tutorials and classes).

Department: Lectures of one hour duration are scheduled from 9am-11am or 9am-12pm most weekdays in Term, totalling around 10-12 hours per week, and are attended by all students reading chemistry (~180 per year). Practical work occupies around two afternoons per week, and from 2018 will be carried out in a new Teaching laboratory; there is also some scope for vacation project work in research groups for those who are interested. Prospective Oxford Chemists should find enjoyment and interest in practical aspects of the subject, as at the end of the day chemistry is an experimental science!
**Jesus College:** The content and frequency of tutorials varies greatly from college to college. At Jesus College, students receive one tutorial per week, in one of the three branches of chemistry (i.e. around eight tutorials per term, with some additional classes). Tutorials normally take place in the Tutor's room in College, in small groups of 2-4 students, and are typically of 1-1.5 hour duration. Tutorials aim to cement understanding of the content of the lecture courses, and also to push students in new directions that complement this material by exploring their understanding of principles. The tutorial is the main teaching focus of the week, and a major part of undergraduates' time is devoted to reading and written work in preparation for the tutorial, as set by the tutor. Tutorials provide a real opportunity to develop presentation skills, to learn how to express ideas and defend opinions, and to think creatively.

To prepare for tutorials, undergraduates often use the College library, which includes a wide selection of up-to-date reference books; in addition, the Radcliffe Science Library includes an extensive collection of books and journals. Access to online chemistry journals is freely available within the University. The College also offers a generous book grant scheme to assist undergraduates with the purchase of books.

Overall, there is no question that the undergraduate Chemistry course is demanding both of time and effort, but this is balanced and rewarded by the range and depth of its coverage, by its scope for individual thought and expression, and by the unparalleled understanding of Chemistry that is developed over the course.

**Examinations:** University exams are taken at the end of each of the first three years. This begins with the Preliminary Examinations (or 'Prelims', which consist of one paper in each of the branches of Chemistry, and one in Maths). Results in these exams do not count towards the final degree. The second year examinations (known as Part IA) comprise one paper in each of Physical, Organic, and Inorganic Chemistry, and contribute 15% towards the final degree mark. The Part IB (or 'Final') examinations are taken at the end of the third year and consist of seven papers, again mostly concerning core elements in each of the three Chemistry branches. These are the most important written examinations that students will sit, and count for 50% of the final degree mark. By this point, students will also have completed a number of practical experiments in the teaching laboratory, which carry an overall weighting of 10%. The fourth year ('Part II') is completed with the submission of a thesis, giving an account of the research undertaken during the year. The assessment of this thesis, and the accompanying oral examination, contribute the remaining 25% of the overall degree mark.

The Honours degree in Chemistry, earned by passing the Part IA/IB Examinations, is classified on the basis of a candidate's combined performance in Part I and Part II. The final degree awarded is the MChem.

**Extracurricular activities:** The Jesus Chemistry Tutors recognise that alongside this academic effort, there are many attractions to university life! Any undergraduate who is a good organiser of time and priorities should have no difficulty in combining the Honour School of Chemistry with non-academic pursuits.

**Admissions**

In a total College entry of about 100 undergraduates in a typical year, around 8-10 candidates are offered places to read for the Honour School of Chemistry. The great majority of candidates applying to read Chemistry will not have taken their A2 level (or corresponding) examinations. The College expects to offer pre-examination candidates places conditional upon gaining A*A*A* grades in the A2 examinations, including Chemistry and Mathematics, with both A* grades obtained in Maths or a Science. Post-examination candidates should have already achieved these conditions to make a competitive application. These standards also give some guidance to the level of performance expected from candidates offering other qualifications, such as the International Baccalaureate or Scottish Advanced Highers; for more details, see: [https://www.ox.ac.uk/admissions/undergraduate/international-students/international-qualifications](https://www.ox.ac.uk/admissions/undergraduate/international-students/international-qualifications)

The expectation is that the majority of Chemistry candidates will be taking three A2 levels (or similar examinations), as well as a number of AS levels. A2 level Chemistry and Mathematics are required for
the course; a further Physical or Biological Science A2 or AS level would also be helpful, but is not a requirement for entry. The Tutors are well aware that candidates are individuals and not just permutations of A-level subjects, and they will be only too happy to answer specific enquiries about the suitability of A2 and AS level or other backgrounds for the Chemistry course, or about the contents of the Chemistry course itself, especially at College open days.

**Written test:** All candidates must take the Thinking Skills Assessment: Section 1 (TSA S1) in their own school or college or other approved test centre on **Thursday 2 November 2017**. Candidates must make sure they are available to take the test at this time. Separate registration for this test is required and the final deadline for registration is **Sunday 15 October 2017**.

Candidates' applications are assessed by the tutors based on academic track record. Those candidates who meet the expected entry criteria are invited for interview at the College early in December, and will have three technical interviews with the Tutors. These interviews are quite informal, as the Tutors will be trying to discover how candidates are likely to respond to tutorial teaching – they are based on understanding rather than extent of knowledge. No written work is needed, and no written test is set at the time of the interview. The outcome of the application will usually be made known early in the New Year. Interviews by Skype are possible for those candidates unable to travel to Oxford.

Further details on the University's admissions criteria for Chemistry can be found at: [http://www.chem.ox.ac.uk/ugrad-admissionscriteria.html](http://www.chem.ox.ac.uk/ugrad-admissionscriteria.html).

**Deferred Entry:** The Tutors have no objection in principle to offering a place to a candidate who wishes to defer entry for a year, provided this intention is made known at the outset. You must apply for deferred entry at the time of application to Oxford: you cannot change your mind after an offer has been made. Please refer to the Departmental web site for subject-specific advice. You should be aware that applicants who are offered places for deferred entry will generally be among the very strongest of the cohort for their subject, and the College limits its offers of deferred places in Chemistry in order not to disadvantage candidates applying in the following year. In some cases, an applicant for deferred entry may be offered a place for non-deferred entry instead.

**Joint Schools:** There are no Joint Schools for Chemistry

**Postgraduate Studies and Careers**

As the central science, Chemistry provides an excellent medium for the development of your critical faculties and intellect, and also instils a variety of important transferable skills that will serve you well whatever your subsequent choice of career. Should you aspire to be a research chemist, the opportunities after graduation are virtually limitless. Major potential employers, in many different sectors, regard the experience gained in the Part II year as a qualification of considerable importance.

A significant number of MChem graduates from Jesus College decide to continue on to postgraduate study, either at Oxford or at another institution. The Department of Chemistry offers DPhil programmes in Inorganic, Organic, Physical and Theoretical Chemistry, Chemical Biology, and a taught MSc in Theoretical Chemistry. Chemistry graduates may also decide to pursue their DPhil in related Departments such as Mathematics, Materials, Physics or Biochemistry.

**Further Information**

If you require any further advice about an application to read Chemistry at Jesus College, please contact the Admissions Officer at: admissions.officer@jesus.ox.ac.uk

The booklet ‘MChem Chemistry’ produced by the Department of Chemistry supplements the University Undergraduate Prospectus in its outline of the Honour School of Chemistry. This booklet is available on the Admissions page of the Chemistry Department website at: [http://www.chem.ox.ac.uk/](http://www.chem.ox.ac.uk/)

Information about admissions is also available on the University's Undergraduate Courses pages.
The Department holds Chemistry open days in late June; for further details, see: 
http://admissions.chem.ox.ac.uk/open-days.aspx

Additional information about Admissions is available at:
http://www.ox.ac.uk/admissions/undergraduate/courses-listing/chemistry

Last updated: May 2017