



University of Glasgow | School of Chemistry

Chemistry and Chemistry with Medicinal Chemistry Level 3

Class Handbook 2019 - 2020

Course Head: Dr Haralampos Miras
Course Secretary: Mrs Susan Lumgair

Room A3-24
Room A4-30

Essential Information

Class Head: Dr Haralampos Miras

Room A3-24

0141 330 4375

Charalampos.Moiras@glasgow.ac.uk

Deputy Class Head: Dr Steven Magennis

Room C5-19

0141 330 7339

Steven.Magennis@glasgow.ac.uk

Class Head Chemical Physics and Chemistry with Mathematics: Dr Smita Odedra

Room A2-26

0141 330 4613

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Class Secretary: Mrs Susan Lumgair

Room A4-30

0141 330 3243

susan.lumgair@glasgow.ac.uk

Laboratories

Organic Chemistry

Inorganic Chemistry

Physical Chemistry

Co-ordinator

Dr Goetz Bucher

Dr Mark Symes

Dr Steven Magennis

Tutorials

Organic

Inorganic

Physical

Co-ordinator

Dr David France

Dr Haralampos Miras

Dr Frances Docherty

MSci Placement Coordinator

MSci Essay Coordinator

Dr Andrew Jamieson

Dr Christophe Busche

Welcome from the Head of School

Welcome back to the School of Chemistry as a member of the Chemistry-3 class. You will now have made a choice about which particular focus within chemistry you wish to pursue – pure Chemistry (Chem), Chemistry with Medicinal Chemistry (CMC), Chemistry with Mathematics (CM), or Chemical Physics (CP). I hope that whichever course you are taking with us, you have a productive and successful year.

The staff involved in delivering the Level-3 courses are here to help you learn and to encourage you in your studies; we trust you will find them friendly and approachable. At Level-3 you find that we are introducing more complex concepts and topics, but your earlier studies should have prepared you well for these. You will also notice that laboratory work is carried out in more depth and, along with the tutorials, is split along traditional Chemistry subject lines – Inorganic, Organic and Physical. The combination of more challenging material and the more challenging laboratory work is vital to your progression towards a recognised chemistry qualification – our degrees are monitored and approved (accredited) at national level by the Royal Society of Chemistry and this approval is based on the recognition that Chemistry is at heart a practical subject.

As detailed elsewhere in this handbook, successful completion of your Level-3 Chemistry course will allow you to proceed to Level-4 courses. For those who are taking an MSci course, you will be aware that between Level-3 and Level-4 you will undertake an external placement; we will work with you to help you secure this placement. At Level-4 many of you will have the opportunity to undertake a research project within one of our research groups. The School is one of the leading UK research schools in Chemistry and the lecturers you encounter will often be leaders in their field, researching and publishing papers as well as lecturing and tutoring undergraduate students.

We are here not only to help you learn, but also to support your studies more generally. If you have any problems with any of the Level-3 Chemistry courses please inform, *as soon as possible*: a) one of your tutors, b) the appropriate lecturer or laboratory head, or c) your class head, Dr Miras (Office A3-24; Charalampos.Moiras@glasgow.ac.uk), so that we can help you.

Please make sure that you read the contents of this booklet and all associated documentation very carefully. All sections are important, but please pay particular attention to those sections dealing with Progression, Attendance, Course Assessment, Absence and Plagiarism. It is absolutely imperative that you inform Dr Miras immediately if you are ill or have other extenuating circumstances that might affect you during the year. If you keep us fully informed, we can make sure that these factors can be taken into account in assessing your overall performance at the end of the year (see also <http://www.gla.ac.uk/registry/students/absence/>). Please also make sure that you are fully aware of the University of Glasgow's regulations concerning plagiarism (<http://www.gla.ac.uk/services/sls/plagiarism/>).

Finally, enjoy yourselves and make the most of your Level-3 studies here in Chemistry.

Professor Graeme Cooke
Head of School
Office A4-08
Graeme.Cooke@glasgow.ac.uk

The class head is Dr H. Miras, Room A3-24.

Email: Charalampos.Moiras@glasgow.ac.uk or Tel: 0141 330 6057.

You are welcome to contact Dr Miras about issues of the course, either directly or through the course secretary, Mrs Susan Lumgair, Room A4-30.

Email: Susan.Lumgair@glasgow.ac.uk or Tel: 0141 330 3243

This booklet contains most of the course information you will need at the start of the session. However, you should get into the habit of checking the class notice boards and Moodle frequently for course announcements. The notice boards are located on the ground floor near the porters' box and on Level-4 near the entrance to the Main Lecture Theatre.

Joseph Black Building access hours

Undergraduate access to the Joseph Black Building is permitted 0830-1730. Unsupervised undergraduate access is prohibited out with these hours on working days and completely prohibited at weekends and on public holidays.

WHAT MAKES UP THE COURSE?

Lectures Check the timetable on Moodle to find out where and when each course is held. The content and Intended Learning Outcomes of each course are also described on Moodle. CHEM and CMC students will attend all organic chemistry lecture courses O1-O6, all inorganic lecture courses I1-I6 and all physical lecture courses P1-P6.

Attendance at Alchemist Club talks and local section RSC lectures is also strongly encouraged.

Tutorials in physical, organic and inorganic chemistry are held weekly, normally on Mondays, Wednesdays and Thursdays, respectively at 10 am. The names of your tutors in organic, physical and inorganic chemistry and times of tutorials will be posted on the class notice board during teaching week 1. Tutors may sometimes have to reschedule a tutorial. Check class notice boards and e-mail regularly for news of such changes.

The weekly tutorial assignments will be available on Moodle.

The tutorial system is a major part of the 3rd Year learning process. To understand the coursework properly and to do well in the degree examination **you must hand in assigned work before each tutorial and attend the tutorial itself.** There is a direct correlation between exam results and tutorial attendance. Most students find the tutorials difficult – they are meant to be! Set aside enough time to tackle them.

Your tutor will:

1. Record your attendance.
2. Pass a record of your attendance and grades to the class secretaries.
3. For monitoring purposes, tutors also record a grade A-E for tutorial work handed in. They may or may not mark the grade on your work, as sometimes the presence of a grade on a piece of work distracts from the useful comments/corrections that may be written by the tutor. However, if no mark is written, tutors will give you an indication of how you are progressing if requested.

Note that tutorial grades will not contribute to the end of year mark.

Workshops give you practical instruction in Organic Spectroscopy and form part of the Organic Laboratory. A workshop on Inorganic NMR forms part of the Inorganic Laboratory. Organic Presentations are held during teaching week 8.

Laboratories

Organic	Weeks 2 - 7	Monday, Tuesday, Wednesday and Thursday.
Inorganic	Weeks 9 – 11 & 17 - 20	Monday, Tuesday, Wednesday and Thursday.
Physical	Weeks 22 - 27	Monday, Tuesday, Wednesday and Thursday.

You should start your laboratory work at 1pm. The laboratories normally close at 5pm.

Your laboratory mark counts toward the grade you will receive in the degree examination.

****IMPORTANT** Safety Regulations**

Please note that due to a recent change in Safety Regulations, it is necessary for anyone working in labs in the School of Chemistry to be wearing **100% Cotton** lab coats. Please check before the labs start that your lab coat is made of 100% cotton otherwise you will not be permitted to carry out lab work.

Supplementary Courses

All students (3H and 3M) are expected to attend the following “Supplementary” sessions presented by Stephen Shilton of the Careers Service; “CV Writing” on Tuesday 24th September (1100-1200) and “Preparing for Interviews” on Friday 11th October (1100-1200). Both sessions will be held in the usual timetabled lecture theatre for that day and time.

Chem 3H and 3M are also expected to attend a short session on “Ethics” on Friday 25th October at 1300 - 1400 (Room A5-04).

Attendance and Participation

The Class Work comprises all Level-3 lectures, laboratory classes, tutorials, workshops and examinations and **all components are compulsory**.

Please read the lecture recording policy here:

<http://www.gla.ac.uk/services/senateoffice/policies/regulationsandguidelines/>

AWARD OF CREDITS: The **minimum requirement** for an award of credits is participation in at least 75% of the Class Work. This means 75% of all tutorials, 75% of all assigned laboratories, 75% of all workshops and 75% of all lectures. Additionally, for MSci students, this will include participation in at least 75% of the Frontiers of Chemistry course. Attendances at all these Class Work components will be monitored.

Participation at a tutorial comprises both of (1) submission of pre-tutorial work and (2) attendance at the tutorial. Pre-tutorial work must be submitted prior to the tutorial on time as requested and will also be noted by tutors. It is understandable that you may not be able to complete all pre-tutorial work. It should be clear however to your tutor if you have made a reasonable attempt at this work. Your tutor, therefore, will use their discretion when deciding if a reasonable attempt has been made. Work handed in at the start of a tutorial will not be considered **You must participate in at least 75% of Inorganic tutorials, 75% of Organic tutorials and 75% of Physical tutorials.**

Participation in laboratories comprises (1) the timely completion of all assigned experiments and (2) the timely submission of laboratory reports for all assigned experiments. Due to the nature of laboratory work, it is not possible to perform experiments out with normal allocated laboratory times. **You must participate in at least 75% of Inorganic laboratories, 75% of Organic laboratories and 75% of Physical laboratories.**

Participation in the Frontiers of Chemistry course comprises attendance at all Friday afternoon sessions and participation in the associated presentations

If you do not meet these requirements, you will not normally be awarded an overall grade or credits for the course(s). If you receive a CR (Credit Refused) for ANY of your courses, this will prevent your future progression.

Please refer to the University of Glasgow Calendar for further details at Section 12, page SciEng.6 (UG):

http://www.gla.ac.uk/media/media_477759_en.pdf

If your attendance and participation has been affected due to illness or other extenuating circumstances, you must provide a medical certificate or written confirmation detailing the circumstances and enter supporting information into MyCampus. Depending upon its severity, this may be taken into consideration.

The class head will monitor your commitment to the course and factor that into an evaluation of your performance in the class exam (teaching weeks 12/13). These will be discussed individually with students at the assessment interviews with Drs. Miras and Magennis, at the assessment interviews during teaching weeks 19 and 20.

EXAMINATIONS

To help you prepare for the degree examination, a formative class examination, consisting of three papers, will be held in weeks 12 & 13.

The Degree examinations are held in April/May and resits in July/August.

A percentage of your April/May performance will be carried forward to contribute to your Final Degree examinations in Level 4 (25% for Honours students and 20% for MSci students).

Note that normally you may take a molecular model kit but **not** textbooks or periodic tables into third year examinations.

The Level-3 Degree examination papers contribute 85% to your final grade for the year. The other 15% comes from assessment of your practical work throughout the session. In addition, CHEM-3M, CMC-3M and CP-3M* MSci students also follow a Supplementary Timetable that involves additional coursework as part of their Frontiers of Chemistry course. Further details can be found in the MSci "Supplement to the 3H Course Documentation".

The course is made up of 18 lecture courses whose descriptions are on Moodle.

For CHEM and CMC 3H/3M students, the level 3 degree examination is based on three, 3-hour written papers; the organic chemistry paper will be based on lecture courses O1 - O6, the inorganic chemistry paper on courses I1 - I6 and the physical chemistry paper on courses P1 - P6.

Use of Electronic Calculators in Examinations

The use of *programmable* calculators is not allowed in examinations. (Please refer to the University Fees and General Information for Students section 20 of the University Calendar, (<http://www.gla.ac.uk/services/learningteaching/aftoolkit/studentinfo/exams/>))

STUDENT PROGRESS

To attain credit for the Level-3 course you must:

- (a) Regularly attend **all** meetings of the class - lectures, tutorials, workshops and laboratories (see "Attendance and Participation" for minimum requirements)

and

- (b) Perform acceptably in the class and degree examinations and in the laboratory

Your adviser of studies will be happy to discuss points of concern with you in confidence. You should also visit your adviser of studies regularly to discuss progress.

PROGRESSION TO LEVEL 4 & REQUIREMENTS FOR B.Sc. (Designated) DEGREES

Full details can be found in the University Calendar (Science section) <https://www.gla.ac.uk/myglasgow/senateoffice/sessiondates/> and in the current Undergraduate Course Catalogue. **All students should check with their adviser of studies on how the regulations apply in their particular case.**

To enter Level 4H you must complete the Level-3H course (120 credits), normally at grade D3 or above. The final decision about progression to Level 4H is made by the Head of School.

Note that a grade D performance at Level 4 corresponds to third-class Honours.

Students who do not attain the minimum grades required at first sitting (April/May exams) to progress will normally be required to take the resit exams in order to graduate in the Winter graduations. Under normal circumstances, students requiring to take resits will not progress on to 4H.

ILLNESS AND ABSENCE FROM CLASSES

If you are unable to attend classes you must follow the **new** University guidelines regarding absence, which are available at the following link:

<http://www.gla.ac.uk/services/senateoffice/policies/studentssupport/absencepolicy/>

You should also contact Dr Miras as soon as possible to explain the reasons for your absence.

If you believe that your performance in the course has been adversely affected for reasons, which you wish to draw to the attention of the Board of Examiners, it is essential that you **write** to Dr Miras to inform him of the circumstances and enter supporting information into MyCampus.

POLICY ON SUMMATIVE ASSESSMENT

All feedback on coursework used in assessment, including mid-year class exam/class test marks and laboratory grades, is strictly provisional for your guidance only, and is subject to ratification by the Board of Examiners and external examiners at the end of the academic year. You must retain all copies of assessed work (lab notebooks, exam scripts, etc.) and have them available for inspection by the examiners if requested at the end of the year. You will be given reasonable advance warning should this be required.

PENALTIES FOR LATE SUBMISSION OF COURSE WORK

Two Schedule A grade points for each working day, or part of a working day, by which the work was submitted after the due date and time for a maximum of five working days; work submitted more than five days after the due date and time would be awarded a Grade H. This means that if work assessed as B1 was submitted 1 day late it will be awarded grade B3, after two days it will be awarded C2, etc.

GRADING

Grading will be in accordance with Schedule A of the University of Glasgow Code of Assessment (http://www.gla.ac.uk/media/media_124293_en.pdf)

SCHEDULE A

All Courses				Primary verbal descriptors for attainment of Intended Learning Outcomes	Honours Class	BDS, BVMS, MBChB
Primary Grade	Gloss	Secondary Band*	Grade Point			
A	Excellent	A1	22	Exemplary range and depth of attainment of intended learning outcomes, secured by discriminating command of a comprehensive range of relevant materials and analyses, and by deployment of considered judgement relating to key issues, concepts and procedures	First	Honours
		A2	21			
		A3	20			
		A4	19			
		A5	18			
B	Very Good	B1	17	Conclusive attainment of virtually all intended learning outcomes, clearly grounded on a close familiarity with a wide range of supporting evidence, constructively utilised to reveal appreciable depth of understanding	Upper Second	Commendation
		B2	16			
		B3	15			
C	Good	C1	14	Clear attainment of most of the intended learning outcomes, some more securely grasped than others, resting on a circumscribed range of evidence and displaying a variable depth of understanding	Lower Second	Pass
		C2	13			
		C3	12			
D	Satisfactory†	D1	11	Acceptable attainment of intended learning outcomes, displaying a qualified familiarity with a minimally sufficient range of relevant materials, and a grasp of the analytical issues and concepts which is generally reasonable, albeit insecure	Third	
		D2	10			
		D3	9			
E	Weak	E1	8	Attainment deficient in respect of specific intended learning outcomes, with mixed evidence as to the depth of knowledge and weak deployment of arguments or deficient manipulations		
		E2	7			
		E3	6			
F	Poor	F1	5	Attainment of intended learning outcomes appreciably deficient in critical respects, lacking secure basis in relevant factual and analytical dimensions	Fail	Fail
		F2	4			
		F3	3			
G	Very Poor	G1	2	Attainment of intended learning outcomes markedly deficient in respect of nearly all intended learning outcomes, with irrelevant use of materials and incomplete and flawed explanation		
		G2	1			
H			0	No convincing evidence of attainment of intended learning outcomes, such treatment of the subject as is in evidence being directionless and fragmentary		

CR	CREDIT REFUSED	Failure to comply, in the absence of good cause, with the published requirements of the course or programme; and/or a serious breach of regulations
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* The Secondary Band indicates the degree to which the work possesses the quality of the corresponding descriptor.

† This gloss is used because it is the lowest grade normally associated with the attainment of an undergraduate award. Postgraduate students should be aware, however, that an average of at least grade C in taught courses is required for progress to the dissertation at Masters level, and students should consult the appropriate degree regulations and course handbooks for the grade they may require to progress to specific awards.

Reassessment Opportunities for Coursework

Section 16 of the University of Glasgow Code of Assessment (Provision for Reassessment) states that students have “no opportunity in respect of courses which contribute to the candidate’s honours classification”. For level 3 chemistry, this applies to all summative assessments for 3H and 3M students. Additionally assessed course components such as work associated with labs will also be exempt from reassessment due to the difficulty involved in providing the opportunity to repeat the coursework.

PLAGIARISM

Plagiarism is the submission of someone else's work as one's own without acknowledgement. As recent cases have shown, it is regarded as a serious offence against University discipline. You must read the Senate-approved *Plagiarism Statement*, which explains the policy of the University.

Degrees from Glasgow University recognise **personal** achievement. It follows that any work you submit must be your own. It may be proper, and even desirable, to include words, data or ideas taken from books or articles, the world-wide web or even from other students in work you submit for assessment. But you **must** make it completely clear what is yours and what you have taken from others. If you copy someone else's words you **must** enclose them with quotation marks. You should **also give** a verifiable reference: for example F.A. Cotton and G. Wilkinson, *Advanced Inorganic Chemistry*, Fifth Edition, John Wiley & Sons, New York, 1988, page 1219 or J. Smith, Level-3 Inorganic Laboratory Report, April 2nd, 2000.

This regulation applies to **all work** submitted for assessment, including lab reports, class tests and research projects unless you have specifically been told otherwise, for example in the case of a group project or when a number of students share experimental data.

You are required to sign a form stating that any work you hand in is your own. This form can be down loaded from Moodle.

See University Guidelines at the following address:

<https://www.gla.ac.uk/myglasgow/leads/students/plagiarism/>

THE CHEMISTRY BRANCH LIBRARY

Our librarian, Louise, has a selection of recommended textbooks, which are available for loan and can also advise students on how to use the extensive collection of chemical literature held in the library.

(a) ESSENTIAL PURCHASES

- **Molecular models**, table molecular model kit such as Organic/Inorganic Orbit kit, Cochranes of Oxford Ltd, Leafield, Oxford OX8 5NT.
https://www.cochranes.co.uk/show_category.asp?id=42
Alternative molecular model kits are sold in University bookshop.
- **Shriver & Atkins' Inorganic Chemistry**, P.W. Atkins, T.L. Overton, J.P. Rourke, M.T. Weller, F.A. Armstrong, OUP 5th Edition 2010.
- **Spectroscopic Methods in Organic Chemistry**, D H Williams and I Fleming, McGraw-Hill, 5th Edition Revised..
- **Organic Chemistry 2nd Edition**, J Clayden, N Greeves, S Warren and P Wothers, OUP.
- **Atkins' Physical Chemistry**, P W Atkins and J De Paula, 9th Edition.

(b) BOOKS RECOMMENDED FOR CONSULTATION – available in the Chemistry Branch Library

- **Maths for Chemists 2nd Edition**, M Cockett and G Doggett, RSC Publishing (Tutorial Chemistry Texts).
- **Introduction to Molecular Symmetry**, J S Ogden, Oxford Chemistry Primers (97).
- **Molecular Quantum Mechanics**, P W Atkins and R S Friedman, 4th Edition, OUP, 2004.
- **Quantum Mechanics in Chemistry**, J Simons and J Nichols, OUP.
- **Fundamentals of Molecular Spectroscopy**, C N Banwell, McGraw-Hill, 4th Edition.
- **Molecular Spectroscopy**, J M Brown, Oxford Chemistry Primers.
- **Nuclear Magnetic Resonance**, P J Hore, Oxford Chemistry Primer (32)
- **Photochemistry**, C E Wayne & R P Wayne, Oxford Chemistry Primers (39).
- **Biophysical Chemistry**, A Cooper, RSC Tutorial Chemistry Texts (16).
- **Crystal Structure Determination**, W Clegg, Oxford Chemistry Primers (60).
- **The Molecules of Life; Physical and Chemical Properties**. J Kuriyan, B Konforti and D Wemmer, Garland Science
- **Reactive Intermediates**, C J Moody and G H Whitham, Oxford Chemistry Primers (8).
- **Selectivity in Organic Synthesis**, R S Ward, Wiley 1999.
- **Organic Stereochemistry**, M J T Robinson, Oxford Chemistry Primers (88).
- **Stereochemistry, Tutorial Chemistry Text**, D G Morris, RSC.
- **An Introduction to Medicinal Chemistry**, G. Patrick, 4th Edition, Oxford University Press, 2009
- **Basic Solid State Chemistry, Second Edition**, A R West, John Wiley.

- **Organometallics**, C Elschenbroich, Cambridge, 3rd Edition.
- **Solid state Chemistry, an Introduction**, L Smart & E Moore, 4th edition, CRC Press.
- **Principles and Practice of Heterogeneous Catalysis**, J M Thomas & W J Thomas, Weinheim, 1996.
- **The Basis and Applications of Heterogeneous Catalysis**, Mike Bowker, Oxford Chemistry Primers.
- **Advanced Inorganic Chemistry**, 6th edition, F A Cotton & G Wilkinson, John Wiley & Sons.

You will be notified of any additional references by your lecturer.