University of Glasgow | School of Chemistry

Programme Handbook

MSc Chemistry

MSc Chemistry with Medicinal Chemistry

Programme Convener: Dr Stephen Sproules

Welcome from the Head of School

Welcome to the School of Chemistry as a member of the MSc Chemistry or Chemistry with Medicinal Chemistry programmes. I hope you have a productive and successful year.

Your lecturers and other staff involved in delivering the MSc courses are here to help you learn and to encourage you in your studies, and we trust you will find them helpful and approachable. In all of our Chemistry MSc courses you find that we are naturally covering some rather complex concepts and topics, but your earlier studies should have prepared you for these. The course delivery in the MSc programme takes a flexible approach with tutorials and workshops tailored to the particular needs of the topics under study. The practical work undertaken during the summer has a strongly investigative angle. You will have the opportunity to undertake a research project within one of our research groups; you are studying in 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 our students.

As always, we are here not only to help you learn, but also to support your studies more generally. If you have any problems with your courses, please inform, *as soon as possible*: the appropriate lecturer, your project supervisor, or the programme convener, Dr Sproules (office A5-14; stephen.sproules@glasgow.ac.uk), so that we can help you.

We would ask you to read the contents of this booklet and associated documentation very carefully. All sections are important, but we should draw your attention in particular to those sections dealing with Progress, Examinations, Course Assessment, Absence and Plagiarism. It is most important that you inform Dr Sproules immediately of any illness or other extenuating circumstances that might affect you during the year. By keeping us fully informed we can make sure that these can be taken into account in assessing your overall performance at the end of the year (see: www.gla.ac.uk/services/senateoffice/policies/studentsupport/absencepolicy/).

Please also make sure that you are aware of the University regulations concerning plagiarism (see University plagiarism website: www.gla.ac.uk/services/sls/plagiarism/).

Finally, enjoy yourselves, and make the most of your MSc studies with us here in the School of Chemistry.

Professor Justin Hargreaves
Head of School
justin.hargreaves@glasgow.ac.uk

1 General structure of the programmes

You will undertake lecture courses, tutorials, and laboratory sessions during semester 1 (September to December, teaching weeks 1–11) and semester 2 (January to March, teaching weeks 17–27). Your progress will be assessed partly based on work submitted during the courses and partly by written exams in the spring examination diet (April/May). Subject to satisfactory performance, you will then progress to your MSc project in one of the School's research laboratories during the summer (June to September). The project will be assessed based on the written dissertation and an oral examination in September.

Details of the regulations applying to this programme can be found in the current University Calendar (www.gla.ac.uk/services/senateoffice/policies/calendar/); in particular, see the section on Science & Engineering Taught Masters degrees.

The convener (head) for this programme is:

Dr Stephen Sproules, e-mail stephen.sproules@glasgow.ac.uk

2 Keeping up-to-date

All course information will be posted on the Chem-4 and PGT Moodle pages and/or via e-mail. Please make sure you regularly (daily) check the Moodle page and your university e-mail. In particular, any changes to the timetable will be announced in this way. Note that your *MyCampus* timetable does not always contain the complete information about hours, venues, and lecturers. You will need to refer to the timetable provided on Moodle for this.

3 Overview of courses

3.1 Lecture courses

All lectures and tutorials will be delivered online for this academic year. Recorded lectures will be delivered according to the timetable and available on Moodle 48 hours prior to the scheduled class. For each lecture module there is a Question & Answer "Q&A" session held live online by the lecturer at a pre-arranged time. These will also be recorded and available on Moodle. Tutorials will be conducted in person for the organic, medicinal and physical chemistry courses, and the organic and physical modules of Special Topics. All inorganic chemistry tutorials are online live. Tutorial work should be submitted to your tutor prior to this session so it can be marked and returned to you before the start of the class. Most announcements, on Moodle or by e-mail, for final year (Chem-4) MSci students about their lectures or tutorials will therefore also be relevant for you. In addition, you will attend the "Frontiers of Chemistry" course together with the Chem-3 MSci class.

The courses are divided into modules of 8 lectures. Each module covers a particular topic and is delivered by a different lecturer; see the table below. Please refer to the *Modules Outlines* on the PHGT Moodle for further details about your lecturers and subject matter of these courses.

Inorganic Chemistry, Organic Chemistry, Physical Chemistry: These three courses are mostly timetabled in the first semester during Weeks 1–11. MSc Chemistry students take all 6 modules in each of the three courses. MSc CMC students take only 4 Inorganic modules and 3 Physical modules.

Special Topics: There are 6 Special Topics modules over both semesters.

Medicinal Chemistry: This course is only attended by CMC students. It consists of 4 modules.

3.2 Tutorials

The lecture modules are complemented by tutorial sessions:

Inorganic: One tutorial per module; Wednesdays, Weeks 4–6, 17–18, 20, 22; 16:00–17:00.
Organic: Weeks 3–8, 10–11, 19, 23–24; Monday, 16:00–17:00.
Physical: One tutorial per module; Tuesdays, Weeks 4–6, 8, 10–11, 20, 22; 16:00–17:00.
Medicinal: Weeks 9, 18, 22; Monday, 16:00–17:00.

3.3 Frontiers of Chemistry course

This course consists of a series of self-contained sessions, some covering aspects outside of, but pertinent to, the science of chemistry. In addition, you are required to write a scientific essay and give a short presentation. Most of the sessions (designated **F**) are scheduled on Friday afternoons; see Section 4 for details.

3.4 Research Skills course

This course consists of laboratory sessions and workshops in preparation for undertaking the summer research project. In Semester 2 you will undertake a mini-research project where you are required to carry out a laboratory experiment, write a scientific report and make a poster presentation. See Section 5 for details.

Code	Lecture Module (8 h each)	Lecturer
i1	Metals in Medicine	Prof. Cronin
¶i2	Inorganic Mechanisms	Dr Miras
¶i3	Industrial Catalysis Chemistry	Prof. Jackson
i4	Applied Coordination Chemistry	Dr Sproules
i5m	Molecular Clusters	Prof. Gregory
i6m	Chemistry of the f-block	Dr Price
o1	Pericyclic Reactions	Prof. Sutherland
o2	Heterocyclic Systems	Dr Boyer
o3	Advanced Organic Synthesis	Dr Prunet
o4	Polymer Chemistry	Dr Schmidt
o5m	Asymmetric Synthesis	Prof. Clark
o6m	Organic Materials	Dr Draper
p1	Macromolecules and Colloids	Dr Magennis
¶p2	Surface Chemistry	Prof. Lennon
¶p3	Advanced Chemical Thermodynamics	Dr Hedley
p4	Modern NMR Spectroscopy	Dr Odedra
p5m	Statistical Mechanics & Reaction Dynamics	Dr Docherty
¶p6m	Theoretical & Computational Chemistry	Dr Senn
#M1o	Biopolymers Chemistry and Synthesis	Dr Jamieson
#M2cmc	Industrial Medicinal Chemistry	Dr Humphreys (GSK) Dr Scott (AZ)
#M3o	Medicinal Chemistry of Cancer	Dr Watts
#M4o	Chemical Biology	Prof. Hartley
S1o	Organometallics in Synthesis	Dr France
S2o	Organic & Bioorganic Supramolecular Chemistry	Prof. Adams
S3i	Molecular Magnetism	Prof. Murrie
S4i	Electrochemistry for a Sustainable Future	Dr Symes
S5p	Surface Structure & Spectroscopy	Dr Karimullah
S6p	Dynamics of Molecular Clusters & Fluids	Prof. Wynne

¶ Chemistry only

CMC only

4 Frontiers of Chemistry course

4.1 Course structure

The "Frontiers of Chemistry" course is comprised of individual lectures as tabulated below. The topics will be dealt with in a mixed format – a mixture of formal lecturing, tutorials, discussions, and presentations that will vary from lecturer to lecturer and from topic to topic. Most Frontiers sessions take place on **Friday** of the respective week. Some sessions are Online Anytime, e.g. F3a, and others are Online Live, e.g. F3b, so do check the timetable to ensure you do not miss any sessions.

If you are having any difficulties with the course, consult the lecturer for the specific session, or Dr Sproules as Programme Convener.

Code	Topic	Lecturer	Week	Time
F3a	Ethics	Dr Paschke	5	13:00–14:00
F3b	Intellectual Property	Prof. Lennon	7	13:00–14:00
F4	Biotransformations	Dr Koehnke	9	13:00–15:00
F5	Introduction to Essay Writing	Dr Nadal	17	13:00–14:00
F6	Submission of MSc Essay	Dr Nadal	21	before 12:00
F7	Introduction to Inorganic Presentations	Dr Busche	23	13:00–14:00
F8	Hot Chemistry	Prof. Wynne	24	13:00–14:00
F9	Inorganic Chemistry Presentations	Dr Busche, Inorganic staff	26	10:00–16:00

4.2 MSc Essay

During Week 17 (session F5), you will be given an introduction on essay writing and also provided with details of the essay assignment. By the end of teaching Week 18, you must choose a supervisor and a subject on which to write an essay of about 4000–6000 words. You should feel free to discuss your choice with the staff members involved and/or the Programme Convener. In any case you must discuss your final choice with the lecturer(s) whose topic you have chosen before you start writing. You can select any member of staff in the School with teaching and research interests in that area, and not just lecturers who taught in Frontiers.

The essay should be started by Week 19 at the latest and submitted through Moodle before 12:00 on Friday, 11 February (Week 21). Your essay will be independently marked by (i) the staff

member who set and supervised the essay and (ii) a second staff member, who will provide an independent assessment of the work.

All essays must be produced using word-processing facilities.

4.3 Assessment of the Frontiers course

You will be required to submit a short piece of coursework for each of the timetabled sessions. This completed coursework will take the form of a portfolio. After each session follow the *Portfolio* link on the Moodle page and complete the set exercise which is a Moodle quiz.

Each section of the portfolio should be completed and submitted before 16:00 on the Friday following each of the Frontiers of Chemistry sessions. For example, the F3a session on *Ethics* held on Friday of Week 5, then your completed portfolio work should be completed before 16:00 on the Friday of Week 6.

Attendance and participation at the Frontiers of Chemistry sessions are compulsory and will be monitored.

The Frontiers of Chemistry course is worth 20 credits. Each piece of submitted portfolio work, the presentation, and the essay will contribute towards your final grade for this course as shown in the table below. Apart from the Essay, full marks will be awarded for participation in each Frontiers of Chemistry session and timely submission of the associated portfolio work. Late submission of work will be subject to a marking penalty.

Session	Contribution	Session	Contribution
F3a	4%	F7	3%
F3b	4%	F8	4%
F4	4%	F9§	8%
F5	3%	Essay	70%

§ Participation in preparation **and** presentation required

5 Research Skills

5.1 Course structure

The “Research Skills” course is comprised of laboratory sessions, an experimental research project and presentation, and workshops as detailed below. For each of inorganic and organic chemistry, you will undertake two undergraduate laboratory sessions. You will then select from the list provided one experiment as your mini-research project, which requires completing a written scientific report and poster presentation at the end of semester 2. Four workshops have been designed to help in you with your research project.

Attendance and participation in the Research Skills sessions are compulsory and will be monitored.

5.2 Laboratory sessions

Two experiments for inorganic and organic chemistry with the purpose of enhancing your practical skills ahead of the research project. Each experiment will be are carried out virtually ("dry-lab" experiments) accessed through the chem3 laboratory Moodle page. Some experiments have scheduled online live sessions enabling to complete the task in small groups with a demonstrator present. Each experiment contributes 5% (20% in total) of your overall grade for this course.

Organic Chemistry (OL)

Lab head: Dr Schmidt, e-mail: bernhard.schmidt@glasgow.ac.uk

Week	Time	Experiment
5		NMR Analysis in Organic Chemistry (online anytime)
6		Grignard Reagents in Synthesis (online anytime)

The experiment is launched from on the Organic-3 Laboratory Course via link on the PGT Moodle page. The work is carried out on the *Learning Science* platform, and you follow each step sequentially to complete the experiment. At the end feedback is provided along a mark out of 15.

Inorganic Chemistry (IL)

Lab head: Dr Symes, e-mail: mark.symes@glasgow.ac.uk

Week	Time	Experiment
9	Mon–Wed 13:00 – 16:00	Inorganic NMR (online live)
10		Synthesis of Cyclopentadienyl Bis-Triphenylphosphine Ruthenium Chloride (online anytime)

The NMR workshop is assessed by a Moodle quiz which is accessible after completion of the three online live sessions. The online anytime experiment is carried on Moodle through the same *Learning Science* setup used for the organic chemistry experiments.

5.3 Mini-Research project (RP)

You will choose one experiment from the list below as the topic of your research project. The practical sessions are scheduled for Monday, Tuesday and Wednesday 13:00 – 17:00 in weeks 20 and 21. Inorganic experiments are week 20 and organic experiments in week 21. Depending on demand, a staggered scheduled might be adopted in order to adhere to any space limitations and social distancing. The research project contributes 70% to your overall grade for this course, which includes planning and carrying out the practical work, writing a scientific report and presenting a poster.

Mini-Research Project Experiments:

1. Chemoselective Reactions of Citral
2. Wittig Reaction
3. Transition Metal Complexes
4. Synthesis and Characterisation of the Polyoxometalate Cluster $\{Mo_{154}\}$

To assist you with organizing your project, preparing the scientific report and presenting the results in the form of a poster, you will attend workshops delivered by a member of the Learning Enhancement and Academic Development Service (LEADS). Each workshop contributes 2.5% (10% in total) to your overall grade for this course.

Code	Topic	Week	Time
W1	Introduction to Mini-Research Projects	17	Tue, 13:00–14:00
W2	Managing practical projects	19	Thu, 10:00–11:00
W3	Writing a Technical Report	24	Mon, 11:00–12:00
W4	Making Posters Stand Out	25	Mon, 11:00–12:00

6 Expected prior knowledge, personal study

The courses at master's level build on prior knowledge in the subject. As you have already obtained a first degree equivalent to a good UK BSc Honours degree in Chemistry, your lecturers will generally expect you to have a level of skills and knowledge similar to a student who has completed the first three years of Chemistry at the University of Glasgow. It is neither practical nor desirable for the lecturers to repeat material already taught at lower levels.

However, no two university curricula are identical, so you will almost inevitably encounter situations where you are not (any more) as familiar with a particular topic as would be required to follow your course. It is your responsibility to identify such gaps quickly and make good use of the free time available for personal study to fill them. Do not hesitate to contact your lecturers to ask for help and advice on particular problems and for additional learning resources.

In addition to the material of the courses you are attending, you will have access to all the material of our Level 1–3 Chemistry courses via Moodle. Also, past examination papers are available in electronic form from the Library. It is recommended that you familiarise yourself early on with the format and type of questions that you will be asked in exams.

7 Student progress

7.1 General considerations for progression

Your performance in your class work for the taught component of the programme will be considered satisfactory only if you:

(a) Regularly attend lectures, tutorials, Frontiers of Chemistry and Research Skills sessions.
(b) Hand in the Frontiers essay.
(c) Video essay, oral examination and written essay assessment for Special Topics.
(d) Complete mini-research project.

The material taught in the lecture courses in semesters 1 and 2 will be assessed by written exams during the spring examination diet in April/May. You can progress from the taught component to the summer research project **only if** you obtain a grade point average (GPA) of 12 (equivalent to C3) or better in the taught courses; at least 75% of the credits contributing to the GPA must be at grade D3 or better, and all credits must be at grade F or better.

If you cannot progress to the project component, you will still be considered for the award of a Postgraduate Diploma (PgDip) or Postgraduate Certificate (PgCert), subject to the applicable regulations.

For the project component of your programme, you will need to:

(a) Carry out a summer research project lasting 12 weeks between June and August, following the timetable in Sect. 8.2.
(b) Provide the School of Chemistry with an electronic copy of a thesis on your project, to be submitted through Moodle by the deadline set in Sect. 8.2.

(c) Attend your *viva voce* (oral) examination as set out in Sect. 8.2

7.2 Examinations and aggregation of marks

7.2.1 Summary of components contributing to final grade

Your final grade is calculated as detailed below; contributions are weighted according to the numbers of credits associated with each course.

A) Taught component: 120 credits
   1. The three or four examination papers as detailed below each contributing 10, 15 or 20 credits (80 credits in total).
   2. Special Topics course: 20 credits.
   3. Frontiers of Chemistry course: 20 credits.
   4. Research Skills course: 20 credits.

B) Project component: 60 credits
   1. Practical performance, assessed by project supervisor: 20%
   2. Dissertation, assessed by two independent Assessors: 50%
   3. Oral examination, assessed by two independent Assessors: 30%

7.2.2 Requirements for the award of an MSc degree and special awards

If you have achieved **at least a GPA of 12** (grade C3) for the taught component and **at least a grade D** for the project component, you will be awarded the degree of Masters of Science (MSc). If you have achieved at least a GPA of 15 (grade B3) in both components, you will be eligible for the award with Merit. If you have achieved at least a GPA of 18 (grade A5) in both components, you will be eligible for the award with Distinction.

7.2.3 Structure of written exam papers for MSc Chemistry

Paper 1: Physical Chemistry (20 credits)

- 4 questions from 6 [2 sections, with at least 1 from Section B]
- 3 h, 100 marks

Paper 2: Inorganic Chemistry (20 credits)

- 4 questions from 6 [2 sections, with at least 1 from Section B]
- 3 h, 100 marks

Paper 3: Organic Chemistry (20 credits)

- 4 questions from 6 [2 sections, with at least 1 from Section B]
- 3 h, 100 marks

7.2.4 Structure of written exam papers MSc Chemistry with Medicinal Chemistry

Paper 1: Physical Chemistry Half (10 credits)

- 2 questions from Q1, Q4 and Q5
- 1 h 30 min, 50 marks

Paper 2: Inorganic Chemistry (15 credits)

- 3 questions from Q1, Q4, Q5 and Q6
- 2 h 15 min, 75 marks

Paper 3: Organic Chemistry (20 credits)

- 4 questions from 6 [2 sections, with at least 1 from Section B]
- 3 h, 100 marks

Paper 5: Medicinal Chemistry (15 credits)

- 3 questions from 4
- 2 h 15 min, 75 marks

7.2.5 Assessment of Special Topics course

Special Topics comprises two modules from Inorganic, Organic and Physical chemistry. Each pair of modules is assessed separately, with each assessment contributing 33.3% to the final grade. The format of the assessment is analogous to the assessment of the research project giving you some experience with these assessment methods.

Inorganic Chemistry – oral examination

- Assessed by the lecturer for your chosen module and the PGT Convener
- Your choice of either *Molecular Magnetism* **or** *Electrochemistry for a Sustainable Future*
- 30 minutes in duration

Organic Chemistry – video essay

- Assessed by the lecturer of your chosen module
- Your choice of either *Organometallics in Synthesis* **or** *Organic Supramolecular Chemistry*
- 10 minute presentation

Physical Chemistry – written essay

- 2000–3000 word limit
- Your choice of topic from either *Surface Structure & Spectroscopy* **or** *Dynamics of Molecular Clusters and Fluids*

7.3 Marking schedule

The results of assessments are usually expressed as a percentage of the maximum number of marks that could be achieved. This percentage will be converted to the University's 22-point scale and corresponding alphanumerical grades.

% Mark	Points	Grade
0.0	0	H
11.7	1	G2
15.0	2	G1
18.4	3	F3
21.7	4	F2
25.0	5	F1
28.4	6	E3
31.7	7	E2
35.0	8	E1
38.4	9	D3
41.7	10	D2
45.0	11	D1
48.4	12	C3
51.7	13	C2
55.0	14	C1
58.4	15	B3
61.7	16	B2
65.0	17	B1
68.4	18	A5
71.7	19	A4
75.0	20	A3
78.4	21	A2
81.7	22	A1
100.0		

Note: This table is a guideline only. The Board of Examiners may decide to use an adjusted conversion for particular assessments or courses.

8 MSc project

8.1 Choosing a project

The three-month research project done over the summer (June to August) is a central part of your MSc programme. You will be working in one of the School's research groups and produce a piece of independent work, evidenced in your MSc thesis.

You should consider the areas of chemistry you wish to undertake as your research project in the first semester as you are attending lectures and learning about the research topics across the School. You should feel free to approach potential supervisors to discuss the possibility of doing your MSc project with them and explore possible topics. Use the information on the School web site to get an overview of the diverse research interests of the School's staff.

You should choose a supervisor by the end of Week 19 (see timetable in Section 8.2) and confirm your choice with the Programme Convener.

8.2 Timetable for MSc projects

Fri, 28/01/2022 Students, after consultation with their prospective supervisor, submit name of supervisor and provisional topic to Programme Convener.

Mon, 06/06/2022 Projects begin. A COSHH form must be completed and signed by the supervisor before any practical work is commenced. *N.B.: This date may shift by a few days. The project begins immediately after the Exam Board meeting*.

Fri, 19/08/2022 Recommended completion of practical work.

Mon, 05/09/2022 **Deadline** for submission of thesis in an electronic copy (PDF format) uploaded on Moodle.

8–16/09/2022 **Oral examinations**. These will be conducted by the two Assessors; the supervisor will not be present.

Wed, 22/09/2022 Exam Board meeting. Results will only be published after approval by the External Examiners. *N.B.: This date is provisional*.

9 School facilities

9.1 Out-of-hours access to the building

PGT students can obtain a key fob that provides 24/7 access to the Joseph Black Building (ramp entrance). Please contact the Programme Convener if you would like to get a key fob.

9.2 Conference room

You are welcome to use the Conference Room (A4-41a) as a place to study provided that (a) you maintain appropriate physical distancing, (b) it is not required for other School purposes, (c) you leave when requested by the janitors, and (d) the room is kept quiet and tidy.

9.3 Computer (Windows) clusters

Several computer rooms with Windows PCs are available for general use when they are not booked for teaching purposes. All clusters have a black-and-white multi-function printer/scanner/copier. The computers use the campus-wide student login and print-quota system.

10 Important regulations

10.1 Safety

The School Safety Committee has issued the following guidelines:

1. Experimental work should normally not start before 8:30 and should finish by 17:30.
2. Prior approval by the supervisor must be obtained should it be necessary for a student to work even for short periods outwith these hours. The usual rules of late working will apply. If the supervisor has to leave before experimental work is complete, written permission must be given and in such cases a designated proxy (academic, post-doctoral, or senior technical staff) must be present in the building.
3. IMPORTANT: Please note that those students performing experimental research projects involving synthesis will be required to wear 100% cotton laboratory coats in the research laboratories.
4. Access to IT equipment will be available only when Janitors are present in the building.

10.2 Illness and absence from class

If you are unable to attend classes, you must follow the University guidelines regarding absence: www.gla.ac.uk/services/senateoffice/policies/studentsupport/absencepolicy/

You should also contact the Programme Convener as soon as possible to explain the reasons for your absence.

If you believe that your performance in a course or an assessment has been adversely affected by reasons that you wish to draw to the attention of the Board of Examiners, it is essential that you ***write*** to the Programme Convener to inform them of the circumstances. You should also submit a Good Cause Claim on MyCampus:

1. Go to the “Student Center” and select My Good Cause from the Academics menu.
2. Select the relevant course(s).
3. Complete the report in MyCampus (there is provision for particularly sensitive information to be provided separately, outwith the system, but a claim report must still be entered into MyCampus).
4. Add supporting evidence by uploading documents.

10.3 Penalties for late submission of course work

Two 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 will be awarded a Grade H.

This means that if work assessed as B1 was submitted 1 day late it would be awarded grade B3, after two days it would be awarded C2, etc.

10.4 Policy on summative assessment

All feedback on coursework used in assessment 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 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.

10.5 Plagiarism

Plagiarism is the submission of someone else's work as one's own without acknowledgment. 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 University policy on plagiarism.

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,* 5th edn., Wiley, New York, 1988, p. 1219; or: J. Smith, Level-3 Inorganic Laboratory Report, 2nd April, 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 downloaded from Moodle.

See University Guidelines at www.gla.ac.uk/myglasgow/leads/students/plagiarism/

10.6 Recording of lectures

Note that lecture recordings and all course materials provided are for your own personal use and can only be used in relation to your studies. Any unauthorised distribution of course materials, including uploading them onto unauthorised web sites and social media sites will be considered a breach of the code of conduct and will be subject to disciplinary action. Please see www.gla.ac.uk/services/senateoffice/policies/regulationsandguidelines/

11 Guidelines for presenting and writing a thesis

The thesis counts for a substantial part of the marks assigned to the project and, in addition, is the only tangible result of the three months of work which can be shown to the External Examiners. It is therefore important that you do not let yourself down with a poorly written or produced thesis. Further details are found on the PGT Moodle.

11.1 Technical points

The thesis should be word-processed; the School has an adequate number of PCs with MS Word installed.

The font should be clear. Fonts normally used are Times New Roman or Arial (usually 10, 11 or 12 point). This document is written in Arial 11 pt with main headings in **14 pt bold** and sub-headings in **12 pt bold**.

The thesis should use 1.5 line spacing and have a reasonable margin on the left hand side to allow for binding if this is required. Margins of 3.0 cm left and right and 2.5 cm top and bottom are acceptable.

Pages should be numbered consecutively, as should diagrams and spectra. Since the word processor will do the numbering for you, it is easier if you do not include whole-page diagrams or spectra in the page numbering, but this is a matter of choice.

Chemical structures can be drawn using ChemDraw and copied into MS Word. On the other hand there is nothing wrong with photocopying/scanning or utilising existing electronic structures (and indeed diagrams) provided that the result looks neat and clear.

11.2 References

Referencing work is very important and is frequently badly done. The format shown in the following examples is that employed by the Royal Society of Chemistry. It should be used unless your supervisor suggests an alternative.

1. **Journal articles**: (*Journal in italics*, year, **volume No. in bold**, page No.)
   I. A. Fallis, L. J. Farrugia, N. M. Macdonald and R. D. Peacock, *J. Chem. Soc. Dalton Trans*., 1989, 931.
   C. Macleod, R.C. Hartley and D.W. Hamprecht, *Org. Lett*., 2002, **4**, 75–78.

   other possibilities are:
   unpublished, in press, personal communication.

2. **Books**: (Authors, *Title in italics*, publisher, place, year, vol No., page if necessary)
   F.A. Cotton and G. Wilkinson, *Advanced Inorganic Chemistry,* 5th Edition, Wiley, New York, 1988, p. 1219.

3. **Theses**:
   N. M. Macdonald, Ph. D. Thesis, University of Glasgow, 1994.
   P.A. Lovatt, B. Sc. Thesis, University of Glasgow, 1993.

11.3 Content

The thesis should contain:

- *Title page*
- *Acknowledgements*
- *Contents page (with page numbers)*
- *A one page Abstract*
- *Introduction*
- *Experimental Section*,
- *Results and Discussion* (or *Results* and *Discussion* as separate sections)
- *Conclusions*
- *References*

The above order is customary but sometimes the *Experimental Section* appears between *Conclusions* and *References* – consult your supervisor.

The **INTRODUCTION** should set the work in context, review previous work (fully referenced), describe any techniques or theories with which you were unfamiliar when you began the research, and describe what you intended to do.

The **EXPERIMENTAL SECTION** should give full experimental details of all reactions or experiments carried out. It is particularly important to indicate which are literature preparations and which are novel. If a literature preparation is reported it is important to note if you modified it or if it behaved in an unexpected way. New compounds should be as fully characterised as possible. It is a good idea to include the actual spectra of new compounds (and other bulky supporting data) in one or more *Appendices*.

The **DISCUSSION** is extremely important and is often where students do not do themselves justice. A project where *absolutely nothing has worked* can be made interesting by discussing **WHY** things went wrong. In any case, the discussion is often where you show how much of the project you understood!

The **CONCLUSIONS** should summarise the work and suggest how it could be continued in the future.

The **ABSTRACT** will be similar to the Conclusions but should be concise and incisive - it is the first thing an examiner will read, and should encourage him or her to read the rest of the thesis!

Finally: **SPELL CHECK YOUR THESIS.**