Topic	**Undergraduate Project Supervision**
Issues for consideration	• **Marking and moderation**
Faculty	Natural Sciences
Department	Chemistry
Name	Alan Spivey, Bridge Duncombe and Chris Braddock
Email address	a.c.spivey@imperial.ac.uk, b.duncombe@imperial.ac.uk and c.braddock@imperial.ac.uk
Description of the approach taken	A clearly defined protocol for evaluating, moderating and ranking final year MSci research projects has been developed. Assessment has three components: Supervisors mark for performance — 10 ECTS 1st & 2nd Independent assessors mark for report — 25 ECTS Oral presentation mark — 3 ECTS 1. The student's *performance* in carrying out the research project is assessed by their research supervisor using defined criteria (see attached appendix). 2. The student's *research report* is assessed by two independent members of staff using defined criteria (see attached appendix). The protocol for determining the final marks for the research project report is as follows: Where the marks for a report from the 1st and 2nd independent assessors differ by 10% or less, the marks are averaged. Where the marks for a report from the 1st and 2nd independent assessors differ by more than 10%, the project is sent to 3rd marker for independent marking (*i.e.* without knowledge of 1st and 2nd marks). At each of the three sectional research project assessment meetings (Inorganic, Organic and Physical), all scripts for which there are three independent markers are discussed first; the three markers justify their marks, may adjust as appropriate, and all adjustments are minuted for scrutiny by the external examiners. If no agreement can be made, the outlying mark is discarded and remaining two marks are averaged. All projects are then placed in rank order and scrutinised against each other. Any adjusted marks at this juncture are fully minuted for scrutiny by the external examiners. 3. The student's *research presentation* is assessed by a panel of staff (excluding the supervisor) at the Departmental presentation. See attached **Appendix** for the criteria as supplied to our students.
Benefits of this approach	The protocol is clear to both students and staff and minimises opportunity for bias and unjust outcomes.
Ways in which your approach has been informed by student engagement	The approach is the culmination of iterative refinement following advices from external examiners. It was informed by discussions at Departmental staff-student committee and teaching committee.
Advice for others	The described protocol works well in Chemistry and may well be adapted for use in other Departments with major research projects.

Maximum 400 words

GUIDANCE FOR CARRYING OUT A BSc/MSci RESEARCH PROJECT & WRITING A RESEARCH REPORT

NB. MSci students ONLY are required to make an oral presentation on their research project.
BSc students ONLY are required to present a poster on their research project.

CARRYING OUT THE PROJECT:

The lab-based research project should be carried out in collaboration with your designated research supervisor. The laboratory work will be carried out in a lab designated by your supervisor. The time available for the project depends on the course you are following:

All BSc projects: You are expected to work in the labs designated by your supervisor on Mondays, Tuesdays, Thursdays and Fridays 1 pm - 5 pm EXCEPT when you have lectures and allowing of course for a one hour lunch break. The project lasts ~8 weeks in either the Autumn or Spring term. The deadlines for submission of the written report vary depending on the term in which the project was carried out and have been designed at allow ~2 weeks free of exam revision *etc*. to write up**. In week 6 of your research project you are required to submit a formative (no ECTS credit associated with it), 10-page literature review (including references) of your project to your supervisor. You will be offered some feedback on this at the end of week 8 of your research project in order to support your write-up and the literature review you have produced can be used as the starting point of your research project report.**

All MSci projects: You are expected to work in the labs designated by your supervisor on Mondays, Tuesdays, Thursdays and Fridays 9 am - 5 pm and Wednesdays 9 am – 12 noon EXCEPT when you have lectures and allowing of course for a one hour lunch break. The project lasts ~20 weeks during the Autumn and Spring terms with a submission deadline for the report write up in the Summer term – see the Key dates document for details.

All projects: Throughout the project, you should meet regularly with your supervisor to update them on what progress you are making. If you are having problems or difficulties with the work you should let your supervisor know as soon as possible. **In particular, if you are ill and cannot work for more than 3 days you should submit a medical certificate to one of the year tutors (year 3: Dr. Silvia Diez-Gonzalez/Dr. Rudiger Woscholski, year 4: Dr. Rob Law/Prof. Chris Braddock). If for some reason you are unable to or unhappy about doing this please contact the Research projects supervisor: Dr. Ian Gould, Senior Tutor: Dr. Rob Law, or Director of Undergraduate Studies: Dr. Bridge Duncombe.**

MSci Interim progress report: MSci students should submit a brief progress report (3 ECTS pass/fail) via Blackboard by the last day of the Autumn term. *Please use the 1 page proforma provided for this*. Summarise your work and compare what you have been able to accomplish with the plan in your initial project proposal. You are *not* being assessed on the progress you have made at this stage. Instead, you are encouraged to review your project honestly, get feedback from your supervisor, and make changes to your plans afterwards if necessary. Doing this informally is an integral part of carrying out your project; our external examiners additionally recommended that your progress and feedback be recorded around the half-way stage.

Safety: You MUST attend a lab safety talk prior to starting laboratory work and abide by the Departmental safety procedures at all times. See: http://www.imperial.ac.uk/chemistry/about/safety/. You cannot start your project until you have attended the safety talk.

Lab book and primary data retention: During the course of your project you must keep a dated lab book in which details of all the experiments/investigations you carry out. **This lab book is the property of the Department and must be retained by your supervisor once the project has finished.** Additionally, you will generate primary spectroscopic and computational data from various instruments/systems that relate to your findings (*e.g.* spectroscopic data, computational output *etc.*). **This primary data, in whatever form (electronic or paper *etc.*) is also the property of the Department and must be given to your supervisor once the project has finished.** It is your responsibility to ensure that happens. This is of paramount importance as this will be required as evidence in the event that it is necessary to check the validity of the data reported.

Confidentiality and Intellectual Property (IP) Containment: It is important to realise that some or all of the research that you carry out during your project may be commercially sensitive. This also applies to the research of others, for example within your research group, which you know about through group meeting presentations

etc. Consequently, it is very important that you discuss with your supervisor what you are able to disclose *before* you plan to disclose/discuss your results to/with people outside of the Department, for example at job interviews. Please note in this context, that the industrial personnel who represent sponsors of our end of year poster sessions and project oral presentations are bound by a written confidentiality/non-disclosure agreement.

FORMAT OF THE REPORT:

Length

There is *no set length*; the objective is to write up your work completely but *concisely*.

Consequently, the following guidelines should not be deviated from unless you (and your supervisor) consider there to be exceptional circumstances which merit this. It is the content rather than the number of pages that counts for assessment.

- A BSc research project report (7.5 ECTS units) should normally have a minimum word count of 5000 words and should not exceed 8000 words (excluding the experimental section and any Supporting Information).
- A MSci research project report (normally 25 ECTS; 20 ECTS for F104/F101; 12 ECTS for F1RX) should normally have a minimum word count of 6000 words and should not exceed 12000 words (excluding the experimental section and any Supporting Information).

The final word count should be stated on the cover page (see below).

General Considerations

There is no single "correct" way to write a good research report (or manuscript for publication in the scientific literature). However, your report should be written in a recognised scientific style that would be appropriate for publication (*e.g.* see articles in the RSC journals, *Dalton Trans.*, *Faraday Disc.* or *Org. Biomol. Chem.*). The RSC templates can be found here: http://www.rsc.org/journals-books-databases/journal-authors-reviewers/author-tools-services/#article-templates

The report should present your final year research project achievements, both positive and negative, in the most clear, concise, accurate and engaging manner possible. Consult your supervisor for advice on preparing your report. However, note that your report will *not* be assessed by your supervisor but rather by two other members of academic staff who may not be specialists in the field of your research. Your report should therefore be written in a way that is also accessible to them, with all specialist notation, terminology and theoretical methods being clearly explained. Failure to produce a manuscript that is broadly accessible to a reader with a general background in the appropriate branch of chemistry is likely to result in a lower mark.

In structuring your report, ask the question "what story am I trying to tell?" and then lead the reader step-by-step through your report with that story constantly in mind. Your introduction is designed to set the context. The experimental description is there to ensure the reader understands the measurements or techniques you have used. The results and discussion sections try to address the issues you have raised in the introduction, and hopefully draw out a few key conclusions or "take-home" messages. Unfortunately, it is common for a reader to get to the end of a research report and to be quite unclear why the research was undertaken in the first place! You should work hard to ensure that this is not true of your report. Throughout, you should bear in mind that one of the key skills of scientific research is *concise* communication. Think carefully about how best to express your ideas briefly but without losing clarity.

Your research supervisor will be able to help you with the format of your report - it is important not to leave writing up too late so that he/she can see an early draft. Another reason for starting to write-up well before the deadline is that you may well think of a finishing touch that will round off your experimental work.

For additional tips on writing a technical report of this type for maximum impact see:

- Slawka Pfauntsch's - Mini Guide to Scientific Writing (see: http://uk.linkedin.com/pub/slawka-pfauntsch/41/b65/761), a 3-page excerpt of which is available on Blackboard.
- The IET Guide to Technical Report Writing (see: http://www.theiet.org/students/resources/tech-report-writing.cfm), also on Blackboard with the mini guide.

The manuscript should include the following sections (further divided into sub-headings wherever needed to enhance readability). Please note, while you should adhere to the guidelines below, there is no single "correct" way to present your manuscript and you may wish for example to reverse the order in which you present the

"Experimental/Theoretical Techniques" section relative to the "Results and Discussion" section compared to that listed below (e.g. this would be typical in a synthetic organic research report).

Cover Page Format

All research reports must provide the following information on the cover:

- The title
- Your name, course and year (*e.g*. Tom Jones, MSci Chemistry, year 4)
- *Your examination (candidate) number*
- The name of your supervisor
- The place where the work was carried out, if not at Imperial
- The date of submission (month and year)
- The word count for the report (excluding experimental section and any Supporting Information)

Title

The manuscript should have a concise title directed at the general reader. Please note that abbreviations in the title should be avoided.

Abstract

The paper must include an abstract which is a summary (50-350 words) setting out briefly and clearly the main objects and results of the work; it should give the reader a clear idea of what has been achieved and what key advances have been made. The summary should be essentially independent of the main text; however, names, partial names or linear formulae of compounds may be accompanied by the numbers referring to the corresponding displayed formulae in the body of the text. Please do not cite references in the abstract. The abstract is often the last section of the report to be written.

Introduction

This should give clearly and briefly, with relevant references, both the nature of the problem under investigation and its background. Please remember that you are being assessed on your ability to undertake and present scientific research, and you should therefore aim to ensure that your report is focused closely on the actual research that you have undertaken. Long introductory sections that do not relate directly to your work will gain you few (if any) marks, so you should avoid writing lengthy literature surveys. Instead you should aim to discuss only those publications that are relevant to your specific project. This could for instance include papers that describe similar devices, materials, measurements and/or techniques to the ones you have employed or previous uses or development of synthetic reactions and their scope, selectivity or environmental impact. You should make it clear why you are mentioning each paper. For instance does your work represent an improvement of work described in that paper? Does it answer a question raised there? Does it contradict the conclusions of that paper? And so on. In other words, you should make it very clear why in the context of your research the reader needs to know about the papers you discuss. And when you come to discuss your own results, you should wherever possible relate the implications of your work back to the publications you have cited.

Aims and Objectives

It is extremely important to set out explicitly what you were aiming to achieve in your research project at the outset. Typically, the overall aim of the project will be a long-term aim with a "big picture" relevance to science and society whereas the objectives will be more immediate, shorter term "milestones" which represent significant steps *en route* to the overall aim. The aims and objectives will of course be framed by the preceding "Introduction" and background literature and should be referred back to in the "Conclusions" and "Future Work" sections.

Experimental/Theoretical Techniques

This section should describe concisely the experimental techniques and procedures you used. Descriptions of experiments/techniques should be given in sufficient detail to enable experienced researchers to repeat them. Descriptions of established procedures are unnecessary. Standard techniques and methods used throughout the work should be stated at the beginning of the section. Apparatus should be described only if it is non-standard; commercially available instruments are referred to by their stock numbers (e.g. Perkin Elmer 457 or Varian

HAI100 spectrometers). The accuracy of primary measurements should be stated. Whenever you are describing routine experimental or theoretical techniques, your description should be terse, to the point, and written in a style/format accepted in the field. Consult your supervisor and/or relevant journals to establish this (*e.g.* the "Instructions for Authors" guides (http://www.rsc.org/journals-books-databases/journal-authors-reviewers/) for the RSC journals, *Dalton Trans.*, *Faraday Disc.* or *Org. Biomol. Chem.*). The reader will not benefit from a lengthy description of a standard technique that he/she may know already, so it is often sufficient simply to provide a literature citation together with any parameter values it is essential that the reader should know. If on the other hand your approach is a modified or new one, you should provide details about why you have used an alternative approach, why it is preferable to other approaches, any special precautions that were adopted and any limitations it might have. If you can quantify these, so much the better.

Results and Discussion

This section presents your experimental results, including some of the things that didn't work as well as those that did - this is important, as it allows the markers to judge how much you did during your time. Remember that much scientific research is unsuccessful. The discussion should explain the significance of your results and provide the basis for suggested avenues of future research (see below). It is usual for the results to be presented first, followed by a discussion of their significance.

You are marked both on the clarity and conciseness of your report. Therefore only relevant results should be presented and figures, tables, and equations should be used for purposes of clarity. This can include the use of flow diagrams and reaction schemes. Repetition or embellishment with unnecessary words or phrases should be avoided. Excessive use of diagrams and duplication of data in text, tables and figures is discouraged. Supporting information and routine data should be included in either the experimental section or in a separate "Supporting Information" file (see below).

Think carefully about the order in which you present your results. If this is done well, it is much easier to convince the reader of your arguments. Also think carefully about what schemes, graphs, figures and diagrams will most clearly illustrate the points you need to make. If you first choose your diagrams before starting the text, you will probably find it easier to write the text around them. Your plots should be clearly presented with titles, labelled axes and error bars if possible. Also, think about ways to make the plot easier to understand - clear labelling is essential. If two graphs are going to be compared in the text, try to present them "one-under-the-other" on common axes for ease of comparison. Similarly, when using ChemDraw (or a similar chemical structure drawing program) to present synthetic schemes, ensure that all structures have the same magnification and provide equivalent levels of synthesis information (*e.g*. reagents, solvent, yield) in an aesthetically pleasing manner. The following additional stylistic and presentational considerations should be taken into account when writing your report:

- ***Grammar and spelling:*** Standard English or American spelling may be used but consistency should be maintained throughout the document.
- ***Abbreviations:*** The use of common or standard abbreviations is encouraged. If non-standard abbreviations must be used these should be defined at the first use.
- ***Variables and fundamental constants:*** e.g., speed of light, *c*, should be in *italics*
- ***Illustrations and figures:***
    - *Preparation of graphics* Lettering used in graphics should be legible at the required size (e.g. 7 point Arial font or Helvetica if Arial is unavailable. Ensure your formatting and labelling is consistent between all graphics. Insets in images should be avoided where possible. However, if insets are used there is no need to shrink down the size of the text, axes labels and symbols in the inset. These should be the same size as in the main graph so that they are readable.
    - *Chemical Structures* Structural formulae should ideally be prepared with chemistry drawing software (e.g. ChemDraw, ChemWindows, ISIS/Draw). Select your drawing preferences within the program carefully and maintain *exactly* the same preferences throughout the document. The "Instructions for Authors" guides for the RSC journals, *Dalton Trans.*, *Faraday Disc.* or *Org. Biomol. Chem*. all provide guidance in this regard.

- *Figure Legends* Figure legends should be included underneath each figure. Each legend should include a figure number (in sequence using Arabic numerals i.e. Figure 1, 2, 3 etc.); short title of the figure (maximum 15 words); detailed legend, up to 300 words.
- *Tables and Table legends* Each table should be numbered and cited in sequence using Arabic numerals (i.e. Table 1, 2, 3 etc). Tables should have a title (above the table) that summarises the whole table; it should be no longer than 15 words). Detailed legends may then follow, but should be concise.

- ***Footnotes:*** Footnotes may be used to present material which, if included in the body of the text, would disrupt the flow of the argument but which is, nevertheless, of importance in qualifying or amplifying the textual material. Footnotes are referred to with the following symbols: †, ‡, §, ¶, ‖etc. Please note that any material that is too extensive for a footnote, but which is relevant to the manuscript conclusions, should be placed in the "Supporting Information" (see below).

Conclusions

This section should state the main conclusions of your research project, and give a clear explanation of their importance and relevance. It should be used to highlight the novelty and significance of the work and how it sits relative to the state of the art in the field. A brief reiteration of the key messages from the "Results and Discussion" section is probably sufficient. Be honest in your appraisal of the status of your work.

Future Work

This section would not normally be found in a published manuscript, but is included here in recognition of the fact that you have only a limited time available to complete your research project. Please state clearly what additional work (if any) you believe would be necessary to complete your project and bring it up to the standard required for publication or to extend it to deliver greater impact and scope.

Acknowledgements

Co-workers and any other individuals who contributed to the work described should be acknowledged in this section. Acknowledgements should be as brief as possible but also accurate and fair in their attribution of credit for stated contributions (family members and friends should *not* be listed here).

Bibliographic References

You are assessed on your command of the literature. Therefore you should ensure that you adequately cite the relevant literature throughout your manuscript. Around 20-40 references might be expected for a BSc project and 30-50 for an MSci project, with further references perhaps included in the "Supporting Information" file (see below).

All references must be numbered consecutively in the order in which they are cited in the text (including those in tables and figure captions, which should be numbered according to where the table or figure is designated to appear). The references themselves should be listed at the end of the manuscript, in numerical order, under the heading "Bibliography" or "References". You are encouraged to use Bibliographic software (e.g. Endnote, RefWorks) to make the task of referencing simpler and ensure a *consistent* format.

The style of journal abbreviations to be used here is as defined in Chemical Abstracts Service Source Index (CASSI). See http://www.cas.org/expertise/cascontent/caplus/corejournals.html. If you cannot locate an authoritative abbreviation for a journal, and if it is not obvious how the title should be abbreviated, please cite the full title. Bibliographic details should be cited in the order: year, volume, page. The names and initials of all authors are always given in the reference; they must not be replaced by the phrase *et al.* The names of journals or their abbreviations should be written in italics. The following examples serve to show the accepted format for references in RSC journals and should not be deviated from:

- ***Article within a journal:***
  - E.V. Koonin, S.F. Altschul and P. Bork, *Nat. Genet.* 1996, **13**: 266-267.
  - Where page numbers are not yet known, articles should be cited by DOI (Digital Object Identifier), e.g. A. R. Jones, *Dalton Trans*., **2005**, DOI: 10.1039/B503459J.

- ***Books:*** J. Barker, in *Catalyst Deactivation*, Ed. B. Delmon and C. Froment, Elsevier, Amsterdam, 2nd edn., 1987, vol. 1, Ch. 4, pp. 253-255.
- ***Patents:*** A.C. Burkin and A.S. Gum, US Pat., 1 171 230, 1990.
- ***Reports and bulletins:*** R. A. Allen, D. B. Smith and J. E. Hiscott, *Radioisotope Data*, UKAEA Research Group Report AEREIR 2938, H.M.S.O., London, 1961.
- ***Published meeting proceedings:*** H. C. Freeman, *Proceedings of the 21st International Conference on Coordination Chemistry*, Toulouse, 1980.
- ***Theses:*** D. Mount, Ph.D. Thesis, University of London, 1977.
- ***Unpublished material:***
    - For material presented at a meeting, congress etc., but not published, the following form is used: A. R. Jones, presented in part at *the 28th Congress of the International Union of Pure and Applied Chemistry*, Vancouver, August, 1981.
    - For material accepted for publication, but not yet published, the following form is used: A. R. Jones, *Angew. Chem. Int. Ed*., in press.
    - For material submitted for publication but not yet accepted, the following form is used: A. R. Jones, *Angew. Chem. Int. Ed*., submitted.
    - For personal communications, the following is used: G. B. Ball, personal communication.

Supporting Information

A Supporting Information section may be included to enhance and increase the impact of your report. Additional material, such as repetitive experimental details and bulky data, may be included. For synthetic projects this should include original *e.g*. ^{1}H and ^{13}C NMR spectra of pure new compounds (1 spectrum per page). This supplementary data can be presented using any format that is suitable to accommodate the data that you wish to present. This file can be presented as a hard copy or electronically (e.g. on a CD).

PLAGIARISM

The department has a policy on plagiarism, which you can find at the link below as part of *academic integrity*. You must read the policy and ensure that you understand what constitutes plagiarism, the seriousness with which the department and College take it and the penalties that are attached to instances of plagiarism.

https://workspace.imperial.ac.uk/chemistry/Public/Teaching/Dept%20of%20Chem%20Plagiarism%20Policy%2012.08.2010.pdf

Please also see ChemCentral for further information as well as further guidance from http://www.imperial.ac.uk/admin-services/library/learning-support/plagiarism-awareness/undergraduates/

In connection with this piece of work note Addendum 2 of the department's policy in particular. *Note also that the policy incorporates a specific series of examples of how to correctly cite sources within an original piece of work (Addendum 3).*

ASSESSMENT:

Assessment of this assignment has three components:

1. Your *performance* in carrying out the research project – this is assessed by your research supervisor using the criteria shown in the attached guidelines.

2. Your *research report* – this is assessed by two independent members of staff using the criteria shown in the attached guidelines. The protocol for determining the final marks for the research project report is as follows:

   - Where the marks for a report from the 1st and 2nd independent assessors differ by 10% or less, the marks are averaged.
   - Where the marks for a report from the 1st and 2nd independent assessors differ by more than 10%, the project is sent to 3rd marker for independent marking (*i.e*. without knowledge of 1st and 2nd marks).
   - At the sectional research project assessment meeting, all scripts for which there are three independent markers are discussed first; the three markers justify their marks, may adjust as appropriate, and all adjustments are minuted for scrutiny by the external examiners. If no agreement can be made, the outlying mark is discarded and remaining two marks are averaged.
   - All projects are then placed in rank order and scrutinised against each other. Any adjusted marks at this juncture are fully minuted for scrutiny by the external examiners.

3. Your research presentation (MSci) OR poster (BSc) – this is assessed by a panel of staff (excluding your supervisor) at the Departmental presentation OR poster session –separate guidelines will be sent out in due course.

For the division of marks between these categories, see the attached guidelines.

SUBMISSION DEADLINE:

A single pdf electronic copy of the report should be uploaded to Blackboard at 12 noon on the specified hand-in day. The Department will print the report for markers to review. More detailed instructions on this will be sent out in due course. This pdf electronic copy of your report will be scanned and if necessary reviewed for evidence of plagiarism.

College policy is that late submissions will receive a mark of zero please see: https://www.imperial.ac.uk/media/imperial-college/administration-and-support-services/registry/academic-governance/public/academic-policy/marking-and-moderation/Penalties-for-late-submission-of-assessed-work.pdf

If you are unable to submit your report on time please do contact your year tutor: Dr. Rob Law or Prof. Chris Braddock to discuss mitigation.

GUIDANCE FOR THE ASSESSMENT OF BSc/MSci RESEARCH *PERFORMANCE* *(by the Research Supervisor)*

These criteria should be combined with the definitions of degree classification given overleaf in making an assessment of the student's performance.

No.	Criterion	Factors	Supervisor	Maximum Marks %
1	skill	technical competence	√	35
2	originality	independence, initiative	√	20
3	productivity & achievement	output, time management	√	35
4	commitment	diligence, motivation	√	10
		Total:	**Supervisor**	**100**

GUIDANCE FOR THE ASSESSMENT OF BSc/MSci RESEARCH *REPORT* *(by the TWO Independent Assessors)*

These criteria should be combined with the definitions of degree classification given overleaf in making an assessment of the report.

No.	Criterion	Factors	Independent Assessor	Maximum Marks %
1	background introduction	quality of coverage context	√	15
2	quality of experimental	volume accuracy	√	30
3	understanding analysis	scientific awareness, justification	√	30
4	Presentation & clarity of message	structure, written style, quality of English	√	25
		Total:	**Independent Assessor**	**100**

DETERMINATION OF FINAL MARKS

For BSc research projects:	Supervisors mark for performance	3.5 ECTS
	1st & 2nd Independent assessors mark for report	7.5 ECTS
	Poster mark	2 ECTS
For MSci research projects (except F104.F101 & F1RX):	Supervisors mark for performance	10 ECTS
	1st & 2nd Independent assessors mark for report	25 ECTS
	Oral presentation mark	3 ECTS
For F104 and F101*:	Overseas supervisors mark for performance	10 ECTS
	1st & 2nd Independent assessors mark for report	20 ECTS
	Oral presentation mark	3 ECTS
For F1R1, F1R2 & F1R4*:	Overseas supervisors mark for performance	6 ECTS
	1st & 2nd Independent assessor s mark for report	12 ECTS
	Oral presentation mark	3 ECTS

**NB*. For all MSci degrees *except* F104/F101 & F1R1/F1R2/F1R4 the year weightings are 1:2:3:4 whereas for F104/F101 & F1R1/F1R2/F1R4 the year weightings are 1:2:3:3. As a result, the contribution of the marks for this project as a percentage of your degree is not directly reflected by the ECTS count; see the Scheme for Award of Honours available on ChemCentral

CRITERIA FOR MARKING APPLIED TO FINAL YEAR BSc/MSci RESEARCH PROJECTS

Clear Fail (~20%):

Research Performance:

1) Skill (technical competence) - a poor level of skill; generally ineffective in the lab despite help.
2) Originality (independence, initiative) - dependent on others, contributed little to project direction. No useful ideas.
3) Productivity and achievement (output, time management) - very poor attendance; minimal effort; no substantial progress.
4) Commitment (diligence, motivation) - uninterested; no real engagement with project or supervisor.

Research Report:

1) Background and introduction (quality of coverage & context) - essentially no background material presented; few non-www references.
2) Understanding and analysis (scientific awareness, justification) demonstrates essentially no understanding of project; no meaningful analysis.
3) Quality of experimental (volume and accuracy) - very few results obtained; quality of data doubtful; format unconventional.
4) Presentation & clarity of message (structure, written style, quality of English) - lacked any apparent order; English usage very poor; no links between text & schemes; poor adherence to report guidelines.

Fail/3rd Borderline (40%):

Research Performance:

1) Skill (technical competence) - a just passable level of skill; implemented some ideas but misunderstood some.
2) Originality (independence, initiative) - did have some ideas but mainly irrelevant and impractical.
3) Productivity and achievement (output, time management) - poor attendance; poor time management, minimal progress achieved.
4) Commitment (diligence, motivation) - expended minimal effort to progress the project.

Research Report:
1) Background and introduction (quality of coverage context) - scientific aims and background poorly conveyed; absent key references/concepts.
2) Understanding and analysis (scientific awareness, justification) - very limited grasp of key scientific issues; little evidence of critical analysis.
3) Quality of experimental (volume and accuracy) - few meaningful results obtained; presentation of data imprecise/inaccurate.
4) Presentation & clarity of message (structure, written style, quality of English) - minimal organisation of material; difficult to follow; unclear; poor English; limited adherence to report guidelines.

3rd/2ii Borderline (50%):

Research Performance:
1) Skill (technical competence) - competent but required significant help with complex tasks/experiments.
2) Originality (independence, initiative) - some ideas which contributed to advancement of the project; mainly carried out routine measurements with little development of experiments or techniques.
3) Productivity and achievement (output, time management) - lacking in commitment; most experiments conducted in a satisfactory fashion.
4) Commitment (diligence, motivation) - showed some interest in progressing the project but easily distracted.

Research Report:
1) Background and introduction (quality of coverage context) - most scientific aims identified; some confusion relating to prioritisation and relevance.
2) Understanding and analysis (scientific awareness, justification) - some comprehension of scientific issues; attempts to apply reason-based analysis.
3) Quality of experimental (volume and accuracy) - some useful data collected; format and presentation non-ideal.
4) Presentation & clarity of message (structure, written style, quality of English) - apparent structure into sections; English acceptable; some text to scheme links; reasonable adherence to report guidelines.

2ii/2i Borderline (60%):

Research Performance:
1) Skill (technical competence) - able to carry out most techniques; receptive to ideas which were then implemented.
2) Originality (independence, initiative) - contributed most ideas to advance the project; some development of new experiments and techniques.
3) Productivity and achievement (output, time management) - effective use of time and good number of reliable results.
4) Commitment (diligence, motivation) - diligent work pattern; keen to achieve progress.

Research Report:
1) Background and introduction (quality of coverage context) - coherent narrative; style slightly derivative; almost all aims specified.
2) Understanding and analysis (scientific awareness, justification) - appreciation of scientific challenges; reasoned justification of strategic decisions taken.
3) Quality of experimental (volume and accuracy) - useful data collected; most important details documented; some inconsistencies.
4) Presentation & clarity of message (structure, written style, quality of English) - English good; clear organisation of material into logical section; Good, clear style; reasonable adherence to report guidelines.

2i/1st Borderline (70%):

Research Performance:
1) Skill (technical competence) - very good skills from outset.
2) Originality (independence, initiative) - required minimal assistance; high level of critical judgement; active in developing new techniques, experiments and approaches.

3) Productivity and achievement (output, time management) - a substantial volume of results generated.
4) Commitment (diligence, motivation) - excellent motivation; voluntarily exceeded expectations.

Research Report:
1) Background and introduction (quality of coverage context) - scientific aims clearly identified; clear comprehension of background; all key refs. cited.
2) Understanding and analysis (scientific awareness, justification) - clear awareness of scientific challenges; logical approach to problem solving.
3) Quality of experimental (volume and accuracy) - good volume of high quality, publishable results; format largely adheres to convention.
4) Presentation & clarity of message (structure, written style, quality of English) - essentially error free; clear logical construction; balanced presentation of message; adherence to report guidelines.

Clear 1st (~85%):

Research Performance:
1) Skill (technical competence) - excellent technical ability; publishable quality of output.
2) Originality (independence, initiative) - excellent grasp of concepts; innovative lines of enquiry self-generated; highly creative and inventive in the development of new techniques, experiments and approaches.
3) Productivity and achievement (output, time management) - excellent productivity and professional level of output.
4) Commitment (diligence, motivation) - tenacious; single minded dedication to advancing the project.

Research Report:
1) Background and introduction (quality of coverage context) - clear display of subject mastery; precise, coherent, structured; all key refs. cited.
2) Understanding and analysis (scientific awareness, justification) - lucid presentation of nub of challenges faced; mature, reasoning-based analysis.
3) Quality of experimental (volume and accuracy) - outstanding volume of high quality, publishable results; substantial project progress made.
4) Presentation & clarity of message (structure, written style, quality of English) - flawless English; clear, logical structure; engaging style; clear developed message; excellent adherence to report guidelines.