Level 3 – Dissertation – GEOL3022
Laboratory, Field and Computer-based Dissertations – Format of the Dissertation

Department of Earth Sciences

These guidance notes cover a level 3 dissertation undertaken as part of the following degree pathways:

BSc Environmental Geosciences (F630)
BSc Environmental Geosciences with Year Abroad (F631)
BSc Geophysics with Geology (F662)
BSc Geophysics with Geology with Year Abroad (F663)
BSc Geoscience (F643)
MSci Earth Sciences (Geophysics) (F644)
MSci Earth Sciences (Environmental Geosciences) (F644)
MSci Geoscience (Geophysics) (Final intake Oct 2013) (F642)
MSci Geoscience (Environmental Geosciences) (Final intake Oct 2013) (F642)
Natural Sciences programmes (FCG0, CFG0 and CFG1)

The detailed and definitive descriptions of the learning outcomes, aims and objectives of the Dissertation module can be found on the online Faculty Handbook.

These notes are intended to help you through the report production process.

Report Production:

Outlined below are the generic guidelines on how to produce your report. Every project is different and not all of the following may apply to every project.

General

Projects completed at earlier years of study will have provided valuable experience of producing a scientific report. All of the dissertation types are quite variable in their scope, and the following general guidelines should be followed:

- Write for a target readership of earth scientists as a whole, just as you would for a paper in a scientific journal. Do not assume that the reader knows you or how your project was designed or executed. Your Internal Examiners may know some of this but your External Examiner certainly will not.
- Write in a 'scientific' rather than a colloquial style throughout.
- Use published papers as your benchmark.

You should aim to devote at least 4 weeks to your write up and allow time to do extra library research to support your discussion and conclusions, revise models, check calculations, draft figures etc. Do not leave all this until the last minute. The deadline comes around sooner than you think. Rushing the completion of a dissertation usually results in significant mistakes and important omissions that will result in loss of marks. It is vital to plan your write-up. Your supervisor will be able to provide guidance but not tell you specifically what to do or what to include. The Department has a limited selection of previous dissertations on a variety of topics, which are available for consultation from the Departmental Office. These should be regarded as examples of content and writing style but not formatting.

If you are dependent on PCs (or workstations) in the Department and Computer & Information Service, do not expect them to be working 24 hours per day throughout the entirety of the dissertation period and particularly in the two weeks before the submission date. Out-of-hours, 24x7 cover is not provided for any computers or facilities.

Most importantly, it is vital that you keep up-to-date back-ups of all computer-based files associated with your project and the report. The **corruption or accidental deletion** of any such material **is not grounds for an extension**.

Front cover
The **front light blue card cover** of your report should state, in this order and each on a separate line:

(i) the title,
(ii) your name,
(iii) "Department of Earth Sciences, Durham University",
(iv) the year, and
(v) "This dissertation is submitted in partial fulfilment of the requirements for the degree X".

Of course, the inverted commas in (iii) and (v) should not be included.
X is the name of the degree programme you are following – e.g BSc in Geophysics with Geology.

Content
Typical contents of a report are outlined below. Adapt this list to your needs, but heed the comments in each section before omitting it in your own report.

Title: should accurately describe the content, but be kept as short as possible, and ideally not more than 12 words.

Abstract: should summarise the essence of your research. The abstract should not exceed one page. It should immediately follow the title on **page 1** of the report. Page 1 is the first page after the cover. The Abstract should include clear statements covering the objectives, method, results and conclusions rather than giving a bland report of what was done. It must be succinct but informative. Statements such as, "…and the results are presented...." are not informative and have no place in an abstract.

List of contents: should follow the abstract. The page number of each chapter, any sections and sub-sections, the reference list and any appendices must be given. A list of figures and tables may be included after the contents, but it is not essential. Word processors, such as Microsoft's Word, can compile such lists automatically.

Acknowledgements: should recognise scientific, technical, logistic and financial help. Do not be over-effusive or frivolous.

The main body: of the dissertation follows, divided into chapters which, depending on dissertation type, may follow the order below. Again every report is different and not all may be appropriate:

Chapter 1 Introduction
Chapter 2 Background / Literature Review
Chapter 3 Methodology
Chapter 4 Results
Chapter 5 Modelling and Interpretation
Chapter 6 Discussion
Chapter 7 Conclusions
References
Appendices

Chapters may also be divided into sections, and sections into sub-sections: e.g.

Chapter 2 Tectonics
2.1 Introduction

2.2 Major strike-slip faults
2.2.1 The Wadayacallit Fault
2.2.2 The Thingummyjig Fault

to make different subject matter easy to find and to give the report clear structure and order.

Here are some suggestions and indication of what each of these chapter suggestions might contain.

Introduction: should include a statement of the research problem, together with your aims and objectives, a description of any hypotheses being tested and your research strategy. Make it quite clear why you have done this research. The Introduction chapter may also contain a claim regarding the importance and significance of what the results might be and your agenda, which is a summary (usually chapter by chapter) of what you will show the reader as the report progresses. The claim is a very important part of the introduction as it focuses the reader's mind on your principal message. The Introduction chapter of a report is difficult to write so it is not recommended that you write this first. If you do write it first, you will probably need to revise it substantially after you have written the Discussion, Conclusions, and Suggestions for Further Work. Write the Abstract last.

Background / Literature Review: should be succinct, but adequate to put the project research in the context of previous work in the general field. A summary of previous work in the exact same study area/location should be also included.

Methodology: should cover the means of data acquisition and analysis. Refer to previously published details of methodology rather than repeat these details, unless you have developed innovative methods yourself. Only a brief description of relevant theory is required. Include the equations you use for data analysis/reduction, with a reference, but note that it is not necessary to include the derivation (unless you have done it yourself). When describing the methods you used, only give a succinct summary of material that is readily available in textbooks. For example, if you are reporting the results of some sample profiles you have measured, do not include a description of the principles of construction of the equipment you have used. You should include a full account of field procedures/acquisition parameters with details of any precautions taken to minimize errors.

Results: will be the core of the report, and may expand to several chapters. The results sections are not simply data-dumps; they must be carefully structured to develop your hypotheses for the reader. Analyse here, or in the methods section, the errors in your results, identifying their source and how large they might be. In reporting your results, data should be presented neatly. Consider putting large quantities of tabulated data in appendices. Care should be taken to describe with full details what processing you applied to your data. Data reduction should include a full analysis of errors. Do not quote numerical results to meaningless levels of precision. You may find it convenient to put the error analysis into the Methodology chapter.

Modelling and Interpretation: should strike a balance between being positive about what your results show and being critical of whether they mean anything. Remember that well documented “failures” to get the results hoped for can be of value, as well as demonstrating good scientific method. Consider alternative interpretations - this merits a lot of careful thought.

Discussion: places your results in a wider context of related work. Critically evaluate the project and your results. Make suggestions for further work, if appropriate.

Conclusions: is more than a restatement of results, but less than a summary of the discussion. The conclusions may be presented as a bullet-point list.

References: follow a consistent bibliographic convention (see section ‘Reference Style’ below) in listing all the references you have cited in the text.

Appendices: useful places to archive data listings or computer programs. However, note that it is not generally a good idea to create an appendix as a dump for your results, even if they consist, for example, of a number of similar graphs. A good rule-of-thumb is that if the reader needs to refer to an appendix in order to fully comprehend some point made in the text, that material should not have

been put in the appendix. Few things are more annoying for the reader than having to refer forwards and backwards in a dissertation to understand what the writer is trying to convey.

NOTE: The **10 basic rules** for formatting your dissertation are contained at the end of this document.

Text style
Some pointers to achieving a good text style are:

- Write in short, simple sentences, one main point per sentence.
- Try to write as you would speak, using direct clear language.
- Don't use a long word when a short one will do.
- Use active rather than passive phrasing wherever possible: use "faults dominate the eastern part of the section" rather than "the eastern part of the section is dominated by faults".
- Don't turn verbs into nouns: use "each bed grades up from sand to silt" rather than "each bed shows an upward gradation from sand to silt".
- Don't string nouns together: use "the flows breached the left levee of the mid-fan channel" rather than "the flows breached the left mid-fan channel levee".
- Avoid jargon, slang and colloquialisms.
- Do not write in the first person – e.g. "the fieldwork was completed and the data analysed" and not "I completed my fieldwork and then I did my data analysis".
- Don't over-use acronyms. Define ones that you do use.
- Put signposts in an argument showing where you have come from and where you are going.

Figure style
Figures must be numbered in the order they are referred to in the text (and no figures should be included which are not referred to in the text). Each figure should be positioned on the page immediately following the first text page on which it is referred to. Thus figures will appear in the report in numbered sequence. The appropriate figures and photos for your report will depend strongly on the nature of the research topic. The figures should be relevant and clear. Some guidelines for good figures are:

- Ideally, all diagrams and figures within the report itself should be digitally produced, although neat hand-drawn and lettered figures are acceptable.
- Keep figures simple rather than cluttered.
- If possible, design figures so that they are set 'portrait' on the page rather than 'landscape' (i.e. not turned on their side.
- Use a simple and clear font. Use different sizes of the same font, or bold or italic version, rather a variety of different fonts.
- Lettering size should be such that capitals are at least 2mm high. 10pt is a better size for most lettering.
- Use several line widths, if appropriate, to add contrast to the line-work.
- Avoid very bold ornament. Also avoid using tones that are too fine or too similar; they will not copy well.

Reference Style
References should be listed is alphabetical order of first author, and presented in a consistent style. There are numerous such styles. If in doubt follow the style adopted in a journal article, both in the manner they are referred to in the text, and in the reference list.

Citations in the text should be in the form "Smith (1986) found…" or "It was found (Smith 1986) that…" Multiple citations are given as "Smith (1986, 1995)" or "(Smith 1986; Jones 1993)". With joint authors, give both names: e.g. "Smith and Jones (1997)"; but for three or more authors give it as "Smith *et al*. (1998)". Note that "*et al*." is an abbreviation for Latin *et alia*, meaning "and others". All references given in the text must be included in the reference list, and vice versa. In the reference list, it is good practice to give the references in full, without abbreviations. Examples are:

Creer, K.M., Irving, E. and Nairn, A.E.M.. 1959. Palaeomagnetism of the Great Whin Sill. Geophysical Journal of the Royal Astronomical Society, 2, 306-323.

Fitch, F.J. and Miller, J.A.. 1967. The age of the Whin Sill. Geological Journal, 5, 233-250.

Francis, E.H.. 1982. Emplacement mechanism of late Carboniferous tholeiite sills in northern Britain. Journal of the Geological Society London, 139, 1-20.

Randall, B.A.O.. 1995. The Great Whin Sill and its associated dyke suite. In: Robson's Geology of North East England, 2nd edn. (G.A.L. Johnson, ed.). Transactions of the Natural History Society of Northumberland, 56(5), 319-327.

The 10 basic rules:

1) Your text **MUST NOT** exceed the specified page limit – 50 pages, cover to cover.

2) Your report **MUST** comply with the format specifications.

3) The text should be **in double-line spacing using 12 pt Times New Roman font on A4 paper, justified on BOTH the left and right sides**, **AND** presented on each page in single-column format (the latter as demonstrated by these guidelines). This font size and line spacing applies throughout and includes the reference list. Only **figure and table captions** may be single-line-spaced and in the smaller **10 pt Times New Roman font** if preferred.

4) Leave a **margin of 20 mm all round, plus an additional 10 mm at the left-hand margin** to allow for binding. Both text and figures should be **printed on one side of the paper only** (right-hand page when bound).

5) All pages should be **numbered consecutively in Arabic numerals** throughout.

6) The report should be **spiral bound on the left-hand edge** and include a pouch bound inside the back cover to accommodate the Appendices CD.

7) **Front and back covers** should be made out of **light blue card** and should include a transparent plastic sheet both front and back. The **front cover** should have your **dissertation title, your name, your degree programme name and the academic year** in that order and in **14 pt Times New Roman font each** on a separate line one after the other centred on the page.

8) It is essential that all submitted materials **do not exceed A4 size**, or are folded so as not to exceed A4 size. Any item which you wish to bind into your report that exceeds A4 in size, such as stereographic projections, computer printout, etc., must be folded to slightly less than A4 in size and have a wide (at least 25mm) left-hand margin for binding. Any foldouts should be slightly narrower than A4 when folded to avoid the right-hand folded edge being cut by trimming of the bound report. However, such pages count within the page limit and should also be numbered.

9) For the paper hard copy, all items for submission should be placed in an A4-sized document wallet with your name and your degree programme name clearly written on the top right-hand corner of the flap when orientated in landscape (long-axis left to right not up and down).

10) You **MUST** keep and **submit a lab notebook** that documents your dissertation project work as it progresses. This lab notebook must be submitted with your paper hard copy dissertation.

Guidance
Any queries should, in the first instance, be addressed to your supervisor and checked on DUO. Only if that fails should you approach the Module Co-ordinator relevant to your degree programme theme (geology, environmental or geophysics – see list at the top of this document).

Prof C. Peirce
Module Co-ordinator, Non-Mapping projects
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