

HONOURS DISSERTATION

ECSC10030	Dissertation in Ecological and Environmental Sciences		
ECSC10031	Dissertation in Ecological and Environmental Sciences with Management	40 credits	Semester 2

Course Organiser: Prof John Moncrieff

The dissertation is worth 40 credits. Details and specifications are given below.

Learning objectives

- to develop a student's ability to conduct research by collecting, analysing, interpreting and presenting data
- to ascertain if the student is capable of putting into practice the knowledge he or she has learnt during the degree programme

We offer a wide choice of dissertation projects and a wide range of supervisors, and there will inevitably be variation in the characteristics of both the dissertation projects and the supervisors. As a premier research University, Edinburgh tries to offer students the opportunity to join active research programmes. Note that great care is taken by University staff to ensure that the success of the student is independent of the dissertation project area selected.

A. How do I find a supervisor?

1. Choosing a topic from the list provided

A list of topics and respective supervisors will be provided towards the end of Year 3, Semester 1; you should discuss topics in which you are interested with the appropriate member of staff.

2. Proposing your own topic

You may also put forward your own topic and, in this case, you are encouraged to seek out a supervisor who can provide appropriate support and expertise.

3. Proposing an external supervisor

If you wish to have a supervisor external to the School of GeoSciences, they will also be paired with an internal supervisor to provide advice on the specific requirements of the dissertation, while the external supervisor can provide the primary scientific expertise.

4. Submitting dissertation selection form

You should complete the selection form and include your first choice of topic and evidence that you have discussed this with the potential supervisor (a signature will be required). The student should also include their second choice of topic (no signature required at this stage).

5. The allocation process

Where possible you will be allocated your first choice but this will depend on the number of students who have selected a particular supervisor. No member of staff will be permitted to supervise more than 4 dissertations.

B. What do I need to do before I start my dissertation?

1. Initial meeting with supervisor

Once you have been allocated a supervisor, you should make contact and have an initial discussion about the dissertation topic. At this stage you should discuss the project thoroughly with your supervisor who will suggest appropriate background reading and methodology.

2. Prepare the one-page outline plan

You will then develop the topic into a one-page outline plan which you will submit directly to your supervisor. The plan should include the title, a brief section on background/rationale, the main questions to be addressed, your hypotheses, the main methods to be used, and a brief indication of what you expect to find.

3. Receive feedback on the outline plan

You will meet with your supervisor and receive feedback on your outline plan regarding its feasibility and/or aspects that you may not have considered or need to develop further.

4. Prepare and submit the full dissertation plan

You will then work up the full dissertation plan, taking account of associated health and safety issues, costs and ethical considerations. This should follow a similar format to the one-page outline plan but should include more specific details, e.g. of the methods to be used, how you will handle the data generated and what you expect to find. The full plan should be three to five pages in length. You will find more detail in section F below.

5. Complete and submit health and safety forms

You are required to give special consideration to the safety aspects of the field or laboratory work proposed. Please discuss with your supervisor whether you will also need to complete a Risk Assessment and/or COSHH form for your project. These forms must be approved by your supervisor before submission.

6. Complete and submit the dissertation budget form

There is a small budget available (see below for further information). Please complete the Dissertation Budget Plan and have your supervisor approve it before submission.

7. Complete and submit an ethics form

All students should complete an Ethics Self-Assessment form for their projects. Your supervisor must approve this and decide whether you need to complete a full ethics assessment to be sent to the Ethics Committee for approval. The ethics form and full details can be found here: https://www.geos.ed.ac.uk/internal/ethics_in_research/

Your health and safety, dissertation budget and ethics forms must be approved by the Degree Programme Convenor before you commence your dissertation.

The full dissertation plan will be retained by the teaching office and will be assessed at the same time as the final dissertation report.

C. Timeline

Activity	Timeline
Summer Dissertation 1-page outline	13 th June 2019
Summer Dissertation Plan submission	20 th June 2019
Winter Dissertation planning sessions	October-December 2019
Winter dissertation	Submit 1-page outline plan, health & safety, budget & ethics forms 16 th January 2020 Submit plan 30 th January 2020
Winter dissertation period	24 th February to 22 nd April 2020
Dissertation submission (all)	Noon on 22 nd April 2020
Dissertation conference (all)	7 th May 2020

You may start the work on your dissertation after:

- your plan has been submitted and then approved by your supervisor
- your health and safety form has been approved by your supervisor and has been checked by the School Safety Advisor
- your budget form has been approved by the Degree Programme Convenor
- your ethics form has been approved by your supervisor and submitted and, if a full ethics form is required, it has been approved by the Ethics Committee

The time allocated for a summer dissertation is eight weeks during the summer vacation (e.g. July-August). For a winter dissertation it is the eight-week period starting in week 7 of semester 2 onwards.

For summer dissertations, you should use the allocated time in semester 2 for analysis of your data. We think that summer dissertation projects are a good idea, because most plants and animals are more active then. However, not everyone is able to work on their dissertation then and there are sometimes benefits to postponing the start of practical work until semester 2.

D What can I expect from my dissertation project and supervisor?

Honours dissertation projects offer undergraduate students educational opportunities not available in other parts of the curriculum. Honours dissertation projects will vary according to your interests, the availability of staff to supervise, and the availability of physical and financial resources.

Feasibility: the dissertation project should be sufficiently circumscribed as to be capable of completion within the time period (i.e. 8 weeks either during the summer or starting in week 7 of semester 2). However, you are strongly encouraged to start preparing for the dissertation project before this (see below).

Available resources: acceptance of the dissertation project plan constitutes an agreement that adequate resources are available for completion of the work. These will vary according to the dissertation project, and may include library, data, buildings, experimental material, equipment, computing power, statistical support, and so on. There is a modest budget to cover some of the necessary costs of the project. Where you are not familiar with techniques (laboratory, socio-economic, statistical, computing, etc.) necessary to carry out the dissertation project successfully, the supervisor must either provide training in the relevant techniques or give the student access to others who will provide the training. However, it is **NOT** the duty of the supervisor to ensure that the student makes effective use of these training opportunities.

Level of supervision: supervisors must guide you but must also ensure that you are offered the means to demonstrate your ability. In the final stages, you may consult your supervisor(s) for guidance on the general form of the dissertation report, specifically its structure and content. The supervisor must not, however, be asked to proof-read or correct it. The student bears ultimate responsibility for the quality of the submitted work.

In summary, the supervisor's input to the dissertation project covers the following three elements:

- the dissertation project must be capable of completion to an adequate level in the available time-scale
- the necessary resources for completion of the dissertation project must be made available. Where the student is lacking in skills required to undertake the dissertation project that were not part of required coursework, training must be made available
- supervision must be adequate to facilitate the necessary educational opportunities and to allow the demonstration of the student's abilities

E What do we expect from you?

We expect you to take advantage of the opportunities to develop the dissertation project, to utilise resources, and to extract benefit from training and/or guidance provided by your supervisor. You should note that the dissertation offers the opportunity to demonstrate those skills which there has been less opportunity to demonstrate elsewhere in the curriculum, and you should be particularly aware of the need to understand and investigate the scientific process, to respond to challenges, to innovate, to take decisions, to be self-reliant, and to bring to bear a wide range of intellectual and personal skills.

Experimental design - all students are expected to be familiar with the contents of the second year *Principles of Ecology* and *Ecological and Environmental Analysis* courses, the third year *Ecological Measurement* course and fourth year *Professional Skills* course. Some aspects of survey and experimental design specific to a given project may not have been treated in sufficient detail, however, and it is essential that you discuss your study design with your supervisor and “go-to” staff on statistics for example as part of the planning process.

Quantitative skills - all students are expected to demonstrate their competence in reasoning with quantitative and/or qualitative data. You are required to assess:

- the quality (both accuracy and precision) of the information on which your conclusions are based.
- the sensitivity of the conclusions to errors in the data.
- all possible alternative interpretations of your results.

In experimental and in most quantitative studies, this will require a full statistical analysis of the data. The appropriate type of analysis depends on the method of data collection and on the experimental design and should always be considered as part of the dissertation project planning. We accept, however, that the specific statistical tests may sometimes differ from those stated in your submitted plan.

Data collection and/or analysis - you are encouraged to design your own experiments (where appropriate) and collect your own data or to work with pre-existing datasets from supervisors or publicly available data (from databases or the literature). If you are working with data being collected as a part of on-going research, it will not always be possible for you to be involved in the collection of the data which you will report on, analyse and evaluate. It is considered desirable, however, that you will have some practical involvement with the data generation process whenever possible.

In some cases, it may be possible to test analytical techniques before collecting any final data. Preliminary analyses using test or hypothetical datasets can be included in the dissertation plan.

Interaction with research group and other researchers - you are strongly encouraged to join the research group meetings of supervisors and to interact with PhD students, postdocs and other researchers.

Time management - it is most important that each student should plan the schedule for dissertation work with their supervisor and keep to this schedule in order to:

- take full advantage of supervisor advice on reviewing the literature and conducting and reporting on the experimental work.
- leave adequate time for the final discussion which is expected to represent your own work.

- ensure that completion of the dissertation does not encroach excessively on other course work.

Ask for help – if there is a health and safety concern about your work you **MUST** speak to your supervisor and/or experienced researchers who are supporting you in your dissertation work about this. In other instances, you should try to overcome challenges that you encounter but you should not be tentative in asking questions of PhD students, post-docs and other experienced researchers and in fact, this is positively encouraged. If insurmountable problems arise, e.g. you cannot get in touch with your supervisor after a reasonable period, then you should inform the Degree Programme Convenor.

If you are working with an external supervisor, you should make sure that you have the best contact information (location/telephone number/e-mail) and have agreed when it is suitable for you to contact them. You should be sure not to abuse the privilege of working in association with an external organisation and if you are unsure about protocol, you should take advice from your internal supervisor.

Students must establish the scale of the dissertation project and the time for its completion, and must bring **early** to the attention of the supervisor (or the Degree Programme Convenor, or their Personal Tutor/Student Support Coordinator, or the Convenor of their Board of Examiners) any perceived shortcoming in the provision of resources, training, or supervision.

Inform on progress - you are responsible for keeping the supervisor informed of progress on a regular basis so that your supervisor knows what you are doing in sufficient detail to potentially be able to stop you if you were to make serious mistakes.

Please remember that your supervisor has other commitments and may not always be able to see you immediately, so do not wait until the last minute. It is unreasonable to hand a supervisor a long document and expect an instant reply. Advance warning is always appreciated.

In summary, it is your responsibility to:

- make good use of the experience and research expertise of your supervisor
- discuss with the supervisor any problems encountered or any significant deviations from the project plan
- keep the supervisor informed of progress at all times
- get in touch with the degree programme convenor (Prof John Moncrieff) if you are having problems, for example, with contacting your supervisor

F. What should I include in submitted documents?

1. Full Plan

Your dissertation plan should be three to five pages in length (font - arial; minimum font size - 11 point; minimum line spacing – 1.5 line; margins - all 2 cm). The plan doesn't have to be long, but the more thinking you can put in at this stage the better it will be for your dissertation planning and progress.

Introduction – include the background to your dissertation topic with reference to major items of relevant literature (not a full literature review). This can be quite short (a page or two), but should focus on the big picture and then narrow down to the specific knowledge gaps that your research will fill. Include a selection of appropriate references to back up your statements.

Objectives/Research questions/Hypotheses – you should include a succinct statement of your objectives, research questions and, where appropriate, specific testable hypotheses (and null hypotheses) for each of the research questions.

Proposed methods of working (field/laboratory/literature search/survey) - include as much detail as possible, e.g. on experimental design elements such as sample size; on methods to be used in construction of survey questions.

Proposed methods of sampling and data analysis (including statistical treatment) – the content of this section will depend on the nature of your project but you should give an account of each method that you propose to use and of statistical tests/other methods that you propose to apply in the analysis of your data. We accept that you may re-evaluate the best tests to use during the course of your final year, e.g. if the nature of your data set changes; in the light of advanced statistical techniques taught during your final year. If possible, you should include an account of anticipated results and their likely importance (in terms of the bigger picture).

Risk mitigation – you should give a brief outline of any anticipated problems which may arise and what you will do to minimise their effect. You should also list the challenges that you anticipate having to overcome during your research.

Proposed timetable of activities, up to the date of submission - you can use a Gantt chart here or similar if you prefer to illustrate your timeline.

2. Dissertation Budget Form (available on Learn)

There is a small budget against which eligible costs associated with your dissertation can be charged. The nominal budget per dissertation is £100, though it is expected that most projects will cost rather less than this. In exceptional circumstances a maximum claim of £200 will be considered if the project demands and the total budget permits. Be sure to keep receipts for any expenses that you incur as these will be required for any refund.

Eligible costs include:

- laboratory analyses (e.g. soil or plant analysis)
- travel costs
- consumables (e.g. chemicals, disposable or minor items of equipment, batteries, etc.)

The budget DOES NOT cover

- subsistence costs while on fieldwork
- normal costs associated with teaching such as inter-library loans.

Additional guidance:

- there are separate budgets for purchasing items of necessary safety equipment, and your supervisor can apply to the School Equipment Budget for items of equipment costing > £100.
- generally useful items of field equipment (e.g. 30 m tapes, spades, secateurs, GPS, etc.) can be borrowed from Phil Wilson (Crew R201; phil.wilson@ed.ac.uk) and more will be purchased if necessary.
- supervisors may also, at their discretion, contribute to the costs of the dissertation from research or other accounts to which they have access, where this is appropriate and within the terms and conditions of that grant/contract.
- most costs for laboratory supplies, etc. will be claimed by the Laboratory Technician directly from the School TO using the normal acquisition forms stating the course name ('Dissertation in ...') and student name.
- costs incurred by you directly can be claimed on the standard University paper Expenses Claim form (available from <http://www.finance.ed.ac.uk/expenses/>) and returned, with receipts attached, to the Course Administrator (ecological.sciences@ed.ac.uk).
- expenses that were not included on the original budget will not normally be approved. It is your responsibility to keep track of your expenses and to ensure that you do not exceed the agreed budget for your project.

3. Dissertation Report

Your dissertation report should be as concise as possible, consistent with inclusion of all the essential information and a clear presentation of the arguments. The length of dissertations should not exceed 10,000 words, excluding title page, table of contents, acknowledgements, list of abbreviations, references, figure/table legends and any appendices. Theses that are unnecessarily long will receive lower marks.

Title Page - should comply with the format prescribed for all honours dissertations

- type the title of the dissertation slightly above the centre of the page using capital letters and double-spacing if two or more lines are necessary.
- the first line should not exceed 14 cm in width.
- centre the word 'by' four spaces below the title and the author's name two spaces below that.

Abstract - a 1.5 line-spaced summary of not more than 250 words. This should contain:

- a description of the research question/knowledge gap – what we know and what we don't know
- how your research has attempted to fill this gap
- a brief description of the methods
- brief results
- key conclusions that put the research into a larger context

Table of Contents - this should list all chapter headings and sub-headings. All should be numbered, e.g. 1. Introduction, 1.1 Background to the dissertation topic, etc.

Acknowledgements – where possible you should carry out all analyses that you include in your dissertation but if this is not the case, you must acknowledge help received, e.g. data given to you, as this is good scientific process. It is important that the markers and External Examiners know exactly what your contribution has been. Please note however, that you are encouraged to seek out expertise, and you will not be marked down for reaching out to experts such as PhD students, postdocs, academic researchers or external scientists for advice, assistance with data collection or statistical analyses.

List of Abbreviations - include this where appropriate.

Introduction - This should:

- introduce the reader to the subject area and clarify the knowledge gap that the dissertation research will fill.
- set the context for the dissertation by reviewing the relevant literature.
- include relevant references to general (theoretical papers and reviews) and specific (specific to the particular question addressed) literature, to justify the research that has been undertaken and define the questions being addressed.
- state the primary research questions and hypotheses in the final paragraph.
- follow an 'inverted triangle' format, progressing from general scientific ideas and why they matter to the specific research questions addressed in the dissertation project.

The introduction should not:

- be just a 'Literature Review'.

Materials and Methods - the methods should explain as concisely as possible where you worked and what you did.

- only include the methods required to repeat your study.
- DO NOT include methods for data you do not present in the dissertation.
- standard analyses or techniques need only be given via a reference to published accounts or protocols.
- use clear subheadings to structure your methods for the reader.

- discuss data manipulations, statistical approaches used and the statistical software in a statistical analysis section.
- other common sections include study location/system (a general description of the sites where research was conducted and/or the organisms studied), field methods and laboratory methods.

Results - this section should summarise the findings of the research referring to all figures, tables and statistical results (some of which may be placed in appendices).

- include the primary results, ordered logically - it is often useful to follow the same order as presented in the methods.
- alternatively, you may find that ordering the results from the most important to the least important works better for your project.
- data should only be presented in the main text once, either in tables or figures; if presented in figures, data can be tabulated in appendices and referred to at the appropriate point in the main text.

Often, it is recommended that you write the results section first, so that you can write the methods that are appropriate to describe the results presented. Then you can write the discussion next, then the introduction which includes the relevant literature for the scientific story that you are telling and finally the conclusions and abstract – this approach is called writing backwards.

Statistical results when reported in the text, tables or figure captions must include:

- the test used (ANOVA, Linear model, Linear mixed effects model, GLM, etc.).
- sample size (N) or degrees of freedom, and if appropriate effect size and error (e.g., slope and error around the slope).
- test statistic (t-value, F statistic, etc.).
- model fit (R^2 , pseudo R^2 , AIC, delta AIC, etc.) if appropriate and p-value.

Additional guidance:

- p-values alone constitutes incomplete statistical reporting (see <http://www.nature.com/news/statisticians-issue-warning-over-misuse-of-p-values-1.19503>).
- full statistical results, additional figures or tables and raw data can be included in an appendix. It is generally not possible to include all statistical results, figures and tables in the main text.
- for guidelines on how to report specific statistical tests, refer to the scientific literature and discuss with your supervisor.
- For students that are using coding-based statistical software such as R, if you wish to show the code for statistical analyses, then it should be included in an appendix.

Discussion - the purpose of the discussion is to summarise your major findings and place them in the context of the current state of knowledge in the literature. When you discuss your own work and that of others, back up your statements with evidence and citations.

- The first part of the discussion should contain a summary of your major findings (usually 2 – 4 points) and a brief summary of the implications of your findings. Ideally, it should make reference to whether you found support for your hypotheses or answered your questions that were placed at the end of the introduction.
- The following paragraphs will then usually describe each of these findings in greater detail, making reference to previous studies.
- Often the discussion will include one or a few paragraphs describing the limitations of your study and the potential for future research.
- Subheadings within the discussion can be useful for orienting the reader to the major themes that are addressed.

Conclusions - the conclusions section should specify the key findings of your study, explain their wider significance in the context of the research field and explain how you have filled the knowledge gap that you have identified in the introduction. This is your chance to present to your reader the major take-home messages of your dissertation research. It should be similar in content to the last sentence of your summary abstract. It should not be a repetition of the first paragraph of the discussion. They can be distinguished in their connection to broader issues. The first paragraph of the discussion will tend to focus on the direct scientific implications of your work (i.e. basic science, fundamental knowledge) while the conclusion will tend to focus more on the implications of the results for society, conservation, etc.

References - all publications referred to in the dissertation should be included here and all references listed here should be mentioned in the text. See below for guidance on the format for references. You may find it useful to use a referencing/citation software such as Zotero (www.zotero.org/) or Mendeley (www.mendeley.com) to insert and format your references.

Formatting Examples

Bradshaw, A.D. and Chadwick, M.J. (1980). *The Restoration of Land: the ecology and reclamation of derelict and degraded land*. Blackwell Scientific Publications, Oxford.

Lawton, J.H. (1989). Food webs. In: *Ecological Concepts* (ed. J.M. Cherrett) pp. 43-78. Blackwell Scientific Publications, Oxford.

Lilleskov, E.A., Fahey, T.J., Horton, T.R. and Lovett, G.M. (2002). Below ground ectomycorrhizal fungal community change over a nitrogen deposition gradient in Alaska. *Ecology*, **83**, 104-115.

University of Sheffield Library (1997). Writing a bibliography. Available from: <http://www.sheffield.ac.uk/library/libdocs/ml-rs11.pdf> [Accessed 27th April 2006].

Additional guidance:

- Do not use the system employed in some other disciplines in which references are referred to by a superscript in the text (i.e. do not use footnotes).
- Note that most Web pages are not refereed. They can be unreliable and should not generally be cited.

- For official documents that are published on the web you should cite the full reference to the paper copy as well as giving the URL in the form above.
- There are good open-access, Web-based scientific journals, but you should avoid citing most other Web pages unless there is no other source of the information.

Appendices - an appendix is defined as an addition to a book or document containing explanatory matter, but not essential to its completeness, i.e. one need not consult the appendix to follow the text. These provide space to allow you to keep your main dissertation text as concise as possible, to include exemplar calculations, to show the code for statistical analyses, to present additional figures, tables and text that are not essential to the main text. You should ensure that its content has clear headings and that it contains legible and neatly presented information.

Tables - should be simple and follow a uniform format throughout your dissertation. You should use relatively few within the main text, as figures usually do a better job of communicating results. Every table should be given a number (e.g. Table 3.1 etc.) and a succinct caption. Tables should be placed as near as possible to that part of the text in which they are mentioned and must be referred to explicitly in the text, e.g. '.... the data summarised in Table 3.1'.

Additional guidance:

- data included in tables should always be given to an appropriate number of significant figures.
- tables should be carefully formatted as found in international journals.
- the table caption should only provide the information necessary to interpret the table.

Figures and other illustrations - should summarise your main results in as clear and concise a way as possible. A figure conveys as much as 'a 1000 words' if designed well, so do use figures, particularly in place of tables if you can.

Additional guidance:

- use creativity when designing your figures and think about how you can present your results most clearly, the statistical analyses you have conducted and any additional information that your reader might require.
- put key statistical results in the figure if appropriate (e.g. R^2 values) or in the figure caption so that the reader can interpret the figure without having to refer back to the main text.
- use colour and multiplot figures when appropriate.
- try to keep colour schemes and figure formatting consistent throughout the thesis. Also, consider trying to make your figures suitable for colour-blind readers (e.g. check colour schemes at <http://colorbrewer2.org/>).
- make sure that size of the axes labels, legends and all other text is such that they are clearly readable.

- Try to avoid using default formatting in excel or R (e.g. ggplot)
- As a general guide, you should have at least one main figure for each specific hypothesis or research question that you test.
- The figure caption should provide all the information necessary to interpret the figure.

4. Working on your dissertation report

Back-up your files - You should ensure that you keep a back-up of all the work you do, and save as you go! Remember to keep the backup copy in a different place from the original. We recommend backing up to your personal computer, an external hard drive and your University digital online storage on a daily basis. Computer crashes, loss or damage are not a viable excuse for handing in a dissertation late.

When you make a new backup do not replace the old one – make a new copy saved with the date of backup in the file name and keep all the earlier backups separately. This is called version tracking. Replacing a backup runs the risk of losing both the current version and the backup if either (a) the current version has become corrupted without you being aware, or (b) the computer crashes while in the process of saving.

You may find it helpful to add a header in the file giving the date when the Dissertation was last updated so that different versions can be distinguished. Remember to delete this header before handing in the final version!

5. Preparing the final copy of your dissertation report

Paper: the regulation size of paper is A4. Print on one side only.

Margins: 2.5 cm : *left-hand (binding) margin*
 2.0 cm : *top margin*
 2.0 cm : *right-hand (fore-edge) margin*
 2.0 cm : *bottom margin*

Spacing and print size: One-and-a-half spacing for text and print size Arial 11 point. Single spacing should be used for references.

Pagination: Place the page number in the centre at the foot of the sheet. Page numbers should be continuous throughout. Page one should be the first page of the *Introduction*.

Proofreading: Proofreading consists of checking the final copy for errors and omissions and is your responsibility. You are encouraged to proofread collaboratively with your fellow students.

Printing and binding: You need to print two copies of the dissertation to be submitted. These will then be taken for binding; binding costs are covered by the School of GeoSciences. You will be able to keep one bound copy after marking. Dissertations must also be submitted electronically as a pdf file.

G How do I submit my dissertation report and how will it be assessed?

1. Submission of Dissertation Report and Penalties for Lateness

You submit an electronic copy of your dissertation via Turnitin by **12 noon on Wednesday 22nd April 2020**. You do **not** need to submit a paper copy of your thesis. The standard late penalties apply, as for any other piece of work [see University regulations]. You should review your progress regularly, and certainly one week before the deadline. If you think that there is a danger of failing to meet it you should consult your Supervisor and Personal Tutor for advice. Printer breakdown or other computer glitches should be expected and are not considered good grounds for an extension. Documentary evidence of the problem will be required.

2. Weighting of the Dissertation Components

The dissertation marking is broken into five components for marking. Below are the components and their relative weighting out of the 40 credits that the dissertation is worth:

- Experimental Design/Execution (includes the Project Plan) - 10 (25%)
- Methods and Results - 10 (25%)
- Discussion and Conclusions - 10 (25%)
- [Written] Dissertation Presentation - 5 (12.5%)
- Oral Presentation - 5 (12.5%)

3. The assessment process

Your dissertation will be read and assessed by two markers, including your supervisor. We will use the standard marking scale and assess the thesis according to the general criteria given below. Each dissertation will differ, but the list below is intended to give you an idea of the general aspects of the thesis that we are evaluating:

- Comprehensive knowledge and understanding of the subject, including the relevant literature (e.g., previous observations, experiments and theory)
- The general format and standard of presentation of the thesis – is it clear and concise?
- Clear, well-justified aims and objectives for the project; statement of research questions and/or hypotheses tested
- Clear and adequate description of methods
- Clear description of the results, including figures, tables and illustrations
- Clear and competent analysis of the results
- Validity and depth of interpretation, innovation and creative thinking
- Integration of the findings with those of other studies in the literature
- Critical appraisal of the methodology and its limitations
- Ideas for further study
- Clear summary of the major findings and the broader implications of the work

Please see the sample marking sheets included in the appendices for further details on what is expected for each component. The common University Marking Scheme is also included.

H What is required for the dissertation conference?

As part of the assessment procedures you need to deliver a short oral presentation (12 minutes long with 3 minutes for questions) on the subject of your dissertation at the Dissertation Conference (**Thursday 7th May 2020**). Students are expected to attend the entire conference and to participate in the discussions.

Preparing your slides: you should use PowerPoint. A printed copy of your PowerPoint slides **MUST** be handed in (to The Course Secretary) on the day of the presentation.

Assessment criteria: your presentation will be assessed and the mark will contribute to the final dissertation assessment. Assessment will be based on skills in communication, presentation and answering questions (which have been developed during the year), as much as on the scientific content (which will already have been assessed in the dissertation itself). A copy of the assessment form is included in the appendices.

Content: you should include a brief introduction which covers the dissertation project aims/objectives and provides information on the wider context of the dissertation project; a description of the methodology used; the major results found; and a discussion and interpretation of the results with reference to the published literature.

You should use your research questions or hypotheses and your overall scientific 'pitch' to frame your presentation. This is a science communication exercise. The strongest presentations will put together a compelling scientific story using simple visual aids, little text on each slide, simplified figures/diagrams and a clear take-home message.

Timing: different dissertation projects will require emphasis of different aspects. Twelve minutes is not long and you will have to be selective in what you present. Do not ask 'how can I cram my project into 12 minutes'; instead, ask 'what are the most exciting outputs of my dissertation and which bits of my project will the audience be able to digest in 12 minutes'. It helps greatly to practise your talk beforehand.

J Appendices

I Recommended Reading

This book provides some useful general information about carrying out your dissertation:

How to Write Your Undergraduate Dissertation (Palgrave Study Skills) by Dr Bryan Greetham. Palgrave Macmillan; 2nd edition, 2014.

II Guidelines about Scientific Writing

Establish a logical structure for your dissertation report. Remember to use the active voice as much as possible. Write using short paragraphs (4 - 7 sentences long) and relatively short sentences (try to have a maximum of 2 clauses per sentence) - with even paragraph and sentence lengths. Make sure you have clear topic sentences for each paragraph and clear summary sentences that link to the next paragraph. Look back at the slides JBM covered in his Professional Skills workshop in Week 3.

Here are links to some scientific writing guidelines:

The 5 pivotal paragraphs in a paper – Dynamic Ecology
<https://dynamicecology.wordpress.com/2016/02/24/the-5-pivotal-paragraphs-in-a-paper/>

JC Cahill's "Finding the "Pitch" in Ecological Writing"
<http://onlinelibrary.wiley.com/doi/10.1890/0012-9623-92.2.196/full>

III Marking Sheets

BSc ECOLOGICAL AND ENVIRONMENTAL SCIENCES / ECOLOGICAL AND ENVIRONMENTAL
SCIENCES WITH MANAGEMENT



MARKING SHEET - HONOURS DISSERTATION

First Marker

Student: «Surname», «First_name»

Title of Dissertation: «Proposed_Title»

Name of First Marker: «Full_name»

***Refer to course grade descriptors for marking guidance**

Assessment Criteria	Comments	*Mark Awarded %
Experimental Design/Execution including the Plan: Did the student develop clear and testable hypotheses and/or research questions? Was the experimental design and the data analysis considered before the start of the project? Is the amount of work reported in the dissertation appropriate for the time available? Was the student diligent in the pursuit of his/her independent research? Was the student able to work independently after initial training?		
Introduction: Has the student summarised the appropriate literature to provide context for the work? Is the knowledge/research gap identified that the student will fill? Has the student clearly expressed research questions and hypotheses in the final paragraph of the introduction?		
Methods: Has the student reported their methods in a logical and detailed manner? Are the methods repeatable? Are the methods of data collection and analysis appropriate, including numerical and statistical techniques? If calculations have been made, are they correct? If a computer package has been used, was it used appropriately and with discretion? Results: Has the student presented the results in a logical and concise manner? Are the data displayed in a way which makes the results and story clear? Are the results adequately described in the text in such a way as to suggest the student has understood their value? Have statistical results been reported correctly including test used (ANOVA, Linear model, Linear mixed effects model, GLM, etc.), sample size (N) or degrees of freedom, effect size and error (e.g., slope and error), test statistic (t-value, F statistic, etc.), model fit (R^2 , pseudo R^2 , AIC etc.) if appropriate and p-value?		

<p>Discussion and Conclusions:</p> <p>Did the student answer their research questions and/or test their hypotheses?</p> <p>Did the student place their results into the wider context of the scientific literature?</p> <p>Did the student provide suggestions for how the work could be improved or extended?</p> <p>Did the student connect their scientific conclusions to conservation, ecosystem function or some other more broadly relevant issue?</p> <p>Does the student provide a clear take-home message for the research project as a whole?</p>		
<p>Presentation of Dissertation:</p> <p>Is the dissertation well written?</p> <p>Is there a logical succession of chapters?</p> <p>Are figures and tables presented appropriately, <i>i.e.</i> with proper titles, legends and axis labels?</p> <p>Are figures and tables well formatted such that interpretation is straightforward and intuitive?</p> <p>Have S.I. units been used throughout?</p> <p>Would it be clear to someone unconnected with this work exactly what the student did?</p> <p>Has the thesis been carefully produced and is it free of errors?</p> <p>Are the in-text citations and the reference list complete and correct?</p> <p>Has the student followed the dissertation guidelines carefully?</p>		

General summing-up of dissertation:

Specific information that should be drawn to the attention of the External Examiner:

First and second markers should mark the dissertation independently using the assessment criteria overleaf. The criteria are guidelines - they are not simply a 'check-list' against which markers can tick off an activity or achievement. Markers should use the comments box as fully as possible. Each marker should first give an overall mark for the dissertation and then allocate marks to the four sections. After the independent marking, **the two markers should meet to agree one final set of marks for the dissertation and these marks are to be entered in the Table on the marking sheet of the first marker, along with an explanation of how agreement was reached.** The final marks should not be the result simply of averaging the two sets but should be the result of a consensus between the two markers. In cases where it is impossible to resolve differences between the markers, the Convener of the appropriate Honours School or his/her delegated representative shall be asked to make a third independent assessment. All three markers must then arrive at one final set of marks and explain below how agreement was reached.

Commentary on how the agreed marks were reached by the first and second markers:
[If agreement was not reached and a third marker used, state the name of the third marker and explain how the agreed marks below were reached]

AGREED MARKS FOR DISSERTATION (%)

	Practical	Methods & Results	Discussion & Conclusions	Dissertation Presentation	Oral Presentation
Agreed Grade					
Points	10 credits	10 credits	10 credits	5 credits	5 credits

SUPERVISOR'S COMMENTS ON DISSERTATION

Student's Name: «Surname», «First_name»

Supervisor's Name: «Full_name»

The following specific comments by the supervisor are required for the assessment of this work

a. LEVEL OF PERSONAL INVOLVEMENT BY THE STUDENT

b. LEVEL OF ASSISTANCE/GUIDANCE GIVEN TO THE STUDENT

c. LEVEL OF STATISTICAL ASSISTANCE OFFERED

d. THE DEGREE OF COMPLEXITY

e. THE SCALE OF THE CHALLENGE

f. SPECIFIC PROBLEMS ENCOUNTERED AND SUCCESS IN OVERCOMING PROBLEMS

IV University of Edinburgh Common Marking Scheme

HONOURS		NON-HONOURS	
Honours Class	Mark (%)	Grade	Non-Honours Description
1st	90-100	A1	Excellent
1st	80-89	A2	Excellent
1st	70-79	A3	Excellent
2.1	60-69	B	Very Good
2.2	50-59	C	Performance at a level showing the potential to achieve at least a lower second class honours degree
3rd	40-49	D	Pass, may not be sufficient for progression to an honours programme
Fail	30-39	E	Marginal Fail
Fail	20-29	F	Clear Fail
Fail	10-19	G	Bad Fail
Fail	0-9	H	Bad Fail