

Department of Earth Sciences

PART II EARTH SCIENCES

PROJECT GUIDE 2020-21

Guide to Part II projects and literature reviews – academic year 2020-21

This document describes the details of the Earth Sciences Part 2 projects and literature reviews for the academic year 2020-21. The overall structure is:

PROJECTS: you will each do 2 projects. The hand-in date for both is **Friday 19 March** (i.e. the final day of Lent term). Each project will be worth 7% of your overall Part 2 mark. Each project has a word limit of 3,000, not including figure captions and the reference list.

LITERATURE REVIEWS: you will each write a single literature review. The hand-in date is **Wednesday 28 April** (i.e. the second day of Easter term). It will be worth 11% of your overall Part 2 mark. The word limit is 4,500, not including figure captions and the reference list.

Each project and the literature review represent independent, stand-alone, pieces of work. Your choices of project and literature review topics are not dependent on each other, or on which part 2 courses you are taking.

The length, content, and difficulty of all work has been designed in light of the Covid-related disruption to last academic year, and possible disruptions during the current academic year. The workload and marking criteria for the projects and literature reviews have therefore been designed to be fair and achievable under the constraints imposed by the pandemic. As a rough guide to overall workload, between them the projects and literature review should represent a similar amount of effort as each of the three courses you will take. The projects and literature review between them represent 25% of your Part 2 mark, as does each course.

The projects and literature reviews are described below. Following on from these descriptions is a series of appendices of general information about independent work (dealing with plagiarism, referencing, and digital security), all of which apply to both projects and literature reviews.

All work should be written electronically with a font size of 11pt or larger, and with page margins of 2cm or larger. All figures should be of sufficient clarity and resolution to be comprehensible – as a rough guide, labels should not be significantly smaller than 11pt.

1. Part 2 projects

1.1 Overall aim

The overall aim of the Part 2 projects is to give you experience of working with Earth Science observations and/or datasets in order to develop and explain a scientific understanding of a given topic. The emphasis in these projects is on using your own work to develop a viewpoint, and to justify that viewpoint. Such work is in contrast to the literature reviews, which are based upon synthesising the results and arguments of others, and developing your viewpoint based upon their previous work. Although you may choose to look at relevant publications for your project work, your mark will depend upon how well you perform your own work, and explain and justify your conclusions, rather than reproducing what is written in the existing literature or course notes. It is perfectly fine for your results to agree with other sources, provided your project is a self-contained justification of that finding, based upon your own work. The project descriptions have mostly been written to be purposefully broad, in order to allow you scope for individuality and specialisation in an aspect of particular interest to you. Each project description will give an explanation of the scientific topic to be addressed, and guidance on the types of work to be done.

1.2 Selection method

The project descriptions will be released at the beginning of Michaelmas term. There will be 12 projects available to choose from. Any number of students can do each project, and you can choose any combination of projects that you like. There will be a briefing session associated with each project that will describe the contents, and allow you chance to ask questions. You may go along to as many of these sessions as you like, in order to get a sense of the full range of projects on offer. The project descriptions list the date, time, and location of the briefing sessions.

1.3 Project logistics

The project descriptions detail the type(s) of work to be undertaken, i.e. computing, sample/thin-section work, or field observations (if possible under the current Covid-related constraints). For projects that involve computing, most will be able to be completed using only free software. For any that involve licenced software, we will provide remote access to department computers with this software installed. You should therefore anticipate performing computing work on your own devices, although if you are working on a laptop or tablet you are, of course, welcome to perform this work in any location accessible under the current social-distancing regulations. Sample-based work will take place in the Part 2 petrology lab, or in some cases using other teaching or museum collections as directed by the project supervisor. If field trips are able to go ahead, these will be department-organised day-trips in Michaelmas term.

The projects involving only computing are designed so that they are able to be completed regardless of the physical location of students, so no changes to these projects will occur due to any Covid-related issues. If there is a significant tightening of Covid-related regulations in early Michaelmas term we will adapt or remove the projects that it would not be possible to complete under the new regulations. If significant changes occur later in the academic year we will create additional Covid-safe aspects to the affected projects, such that you will be able to make use of the work you have already done, but will also be able to continue working on the same topic under the constraints imposed by the regulations at that time.

You will be entitled to two supervisions per project, in addition to the initial project briefing session. It will be your responsibility to contact the relevant staff member when you would like to have each

of these supervisions. Their content should be directed by you, dealing with questions that you would like to ask about your project work.

General statements on plagiarism are provided in Appendix A. The nature of these projects, with multiple students using the same observations and/or datasets, means you should be mindful to avoid unintentional plagiarism. You should record your own field notes, sketches, and photographs on the fieldtrips (if they go ahead), and work independently on the samples, thin sections, and datasets, avoiding discussing your findings with other students. In exceptional circumstances (e.g. camera or phone failure during a fieldtrip) you will be able to make use of other people's field photographs, but you should ask for explicit approval from Alex Copley and Helen Averill before doing so.

1.4 Submission method

Both project reports should be submitted electronically, by **4pm on Friday 19 March**. Submission will be electronic, with further details provided nearer the time.

1.5 Marking criteria

When marking the project reports, the examiners will be placing significant emphasis on the degree to which you have used your own observations and/or analysis in order to develop and justify your conclusions on the topic of the project. Although you may refer to the published literature or course material if you chose, your mark will be governed by the work you have done yourself using the information and/or observations available to you. We do not expect new conclusions previously unknown in the topic, but rather we are looking for a coherent analysis of the conclusions that you are able to form based upon the work that you have undertaken. The mark scheme that will be used by the examiners is shown below.

%	Class	Criteria
90-100	1	Brilliant project. Exceptional observations and/or analysis. Outstanding critical analysis, full of insight, with conclusions superbly justified and based directly upon the student's work. Excellently organized, expressed and illustrated
80-89		Excellent project work. Very good observations and/or analysis. Effective critical analysis. Conclusions well-justified and based on the student's work. Well organized, expressed and illustrated.
70-79		Good observations and/or analysis. Conclusions dominantly based on the student's work. Some critical analysis. Well organized, expressed and illustrated.
60-69	2.1	Sound to good observations and/or analysis. Conclusions mostly justified by the student's work. May contain minor errors or omissions. Well organized, coherent and adequately illustrated.
50-59	2.2	Lacks some detail in content. Conclusions partly justified by the observations and/or analysis. Contains significant errors or omissions. Some deficiencies in organization, style or illustration.
40-49	3	Conclusions not justified by the observations and/or analysis. Contains numerous errors or omissions. Project has merit but lacks a sound structure. Concepts poorly expressed and illustrated.
30-39	Fail	Inadequate content, some maybe irrelevant. Poorly organized, expressed and illustrated
20-29		An attempt at the project, but lacking most relevant content.
10-19		A submission with only isolated glimpses of relevant content.
0-9		A nearly worthless or irrelevant submission.

2. Part 2 literature reviews

2.1 Overall aim

The literature review provides an opportunity for you investigate the current state of the art in an active research topic. The aim of the work is to provide an overview of the current knowledge, debates, and future perspectives in your chosen research topic.

2.2 Selection method

At the start of Michaelmas term you will be provided with a list of literature review topics that have been put forward by academics in the department. If you are particularly interested in a topic not on the list, you are welcome to contact any member of academic staff who knows that field, and ask them to devise a new topic in your area of interest. You are also welcome to find out more about the advertised topics by discussing them with the member of staff who has proposed them. By 27 October you are required to submit to Helen Averill (by email to hpd20@cam.ac.uk) your preferred three topics, in order of priority. The topics will then be allocated to students. If some topics or subject areas are over-subscribed, there will be a period in which the relevant staff members will devise new topics, to ensure that everyone is able to write a review in the broad subject area of their choice.

2.3 Literature review logistics

When you have been allocated a topic, you should arrange to meet with the supervising staff member, and have a supervision in which you are given an overview of the topic, suggestions for good places for you to start with the literature on the topic, and authors and/or research groups to look into. You will then be responsible for reading this material, and also becoming familiar with the other literature in the field. A good way to explore the relevant literature can be to read papers cited in those you think are important, and also to use an online citation database (e.g. Scopus, Google Scholar, Web of Science) to see who has cited the papers you think are important. You are entitled to one further supervision about your literature review, in which you are able to ask questions about the papers you have been reading. The contents of this supervision should be directed by you. The structure and contents of your report is your responsibility, and you should not ask anyone in the department to comment on your drafts.

In order to guard against adverse effects from any future Covid-related university closures, it will be worth you finding out about how to access papers through the University system from outside the university network (either by VPN or by using your raven login on publisher web pages). Because remote access to the literature is possible, there will be no changes to the literature review specifications should Covid-related restrictions change. If you have any queries on remote access to the scientific literature, please enquire with Sarah Humbert in the library.

2.4 Submission method

The literature review should be submitted electronically, by **4pm on Wednesday 28 April**. Further details will be provided nearer the time.

2.5 Marking criteria

The examiners are looking for literature reviews that are clear, well-explained, logically structured, and deal with a suitably complex topic. Credit will be given to reviews that describe the logic and/or observations underlying the concepts presented, including those that form the basis for any controversies that may be present. Good reviews will rely on the published literature, rather than

material from the taught courses. Critical analysis is encouraged. The marking scheme is summarised below.

%	Class	Criteria
90-100	1	Brilliant review. Exceptional understanding of subject and literature. Outstanding critical analysis, full of insight. Excellently organized, expressed and illustrated
80-89		Excellent understanding of subject and literature. Effective critical analysis and grasp of relevant literature. Well organized, expressed and illustrated.
70-79		Very good understanding of the subject and literature. Some use of course material. Some critical analysis. Well organized, expressed and illustrated.
60-69	2.1	Sound to good understanding of the subject and literature. Some reliance on course material. May contain minor errors or omissions. Well organized, coherent and adequately illustrated.
50-59	2.2	Significant reliance on course material. Lacks some detail in content. Contains significant errors or omissions. Some deficiencies in organization, style or illustration.
40-49	3	Based entirely on course material. Contains numerous errors or omissions. Submission has merit but lacks a sound structure. Concepts poorly expressed and illustrated.
30-39	Fail	Inadequate content, some maybe irrelevant. Poorly organized, expressed and illustrated
20-29		An attempt at the review topic, but lacking most relevant content.
10-19		A review with only isolated glimpses of relevant content.
0-9		A nearly worthless or irrelevant submission.

Appendix A – plagiarism

(This is a shortened and more subject-specific version of the University statement, the full version of which can be found on the University website).

Definition and scope

Plagiarism is defined as submitting as one's own work, irrespective of intent to deceive, that which derives in part or in its entirety from the work of others without due acknowledgement.

Plagiarism is the unacknowledged use of the work of others as if this were your own original work. It is always wrong and a breach of academic integrity, whether in supervision exercises, project reports, exam answers or published papers. The University regards plagiarism as a serious offence. The penalties for plagiarism may be severe and may lead to failure to obtain your degree. The University reserves the right to check any submitted work for plagiarism, and can do so with increasingly sophisticated software.

The golden rule is that there should be no doubt as to which parts of your work are your own original work and which are the rightful intellectual property of someone else.

Plagiarism may be due to copying (using another person's language or ideas as if they are your own) or collusion (where collaboration is concealed to gain unfair advantage).

Methods and media

Methods of plagiarism include:

- Quoting directly another person's language, data or illustrations without clear indication that the authorship is not your own and without due acknowledgement of the source.
- Paraphrasing the critical work of others without due acknowledgement. Changing words or their order does not avoid plagiarism, if you are using someone else's original ideas without acknowledgement.
- Using ideas taken from someone else without reference to the originator.
- Cutting and pasting from the Internet to make a pastiche of online sources.
- Colluding with another person, including another candidate (other than as explicitly permitted for joint project work).
- Submitting as your own work research that has been contributed by others to a joint project.
- Submitting work that has been done in whole or in part by someone else on your behalf (such as commissioning work from a professional agency).
- Submitting work that you have already submitted for a qualification at another institution or for a publication without declaring it and clearly indicating the extent of overlap.
- Deliberately reproducing someone else's work in a written examination.

Plagiarism can occur with respect to all types of sources and in all media:

- not just text, but also figures, photographs, computer code etc,
- not just material published in books and journals, but also downloaded from websites or drawn from other media,

- not just published material but also unpublished works, including lecture handouts and the work of other students.

Avoiding plagiarism

The conventions for avoiding plagiarism in the Earth Sciences are as follows:

- When presenting the views and work of others, cite the source in ways such as ‘...as shown by Jones (1938)’.
- If quoting a secondary source, to which you have not gained access, make this clear in ways such as ‘...Hailstone (1802) as discussed by Marr (1916, p. 176).’
- If quoting text verbatim, use quotation marks or indented text and a citation; e.g. “Many of the great movements above described, appear to have been produced by an action both violent and of short duration.” (Sedgwick 1836).
- If using an exact or redrawn copy of a figure from another work, cite the work in the figure caption; e.g. ‘redrawn from Hughes (1866).’
- If incorporating data into a figure from another source, cite the source in the figure caption; e.g. ‘orientation data taken from Whittington (1938).’
- Collaboration with staff or other students during project research may arise during, for instance, Part II or Part III projects. If there is likely to be any doubt as to who contributed which parts of submitted work, make this clear in the text wherever necessary; e.g. ‘Prof. I.N. McCave supplied the comparative data on contourites in table 3.’
- Wherever a source is cited, the full bibliographic reference –including title, journal, volume and page numbers –must be given at the end of the report or essay, except in an essay done in exam conditions. Candidates are not required to make full citations in written examinations but should reference where appropriate.

Checking for Plagiarism

The University subscribes to Turnitin UK software which provides an electronic means of checking work for originality and is widely used in UK universities. Visit the Departmental website to find the document explaining how Turnitin UK will be used by the Department of Earth Sciences and which explains the implications of submitting your work to the software. Written work will only be checked if a candidate is suspected of plagiarism.

Appendix B – Referencing

To cite a publication in your project report or literature review, using one or both of the following styles, dependent on context and writing style.

For a reference to a publication as part of the text of a sentence:

“The relationship between mantle potential temperature and oceanic crustal thickness was analysed by *McKenzie and Bickle [1988]*, who concluded that...”

Or for a reference not as part of the text of the sentence itself:

“... because of the relationship between mantle potential temperature and oceanic crustal thickness [*McKenzie and Bickle, 1988*].”

All works cited in the text should be included in a reference list at the end of the document, using the following formatting:

“D. McKenzie and M. Bickle, The Volume and Composition of Melt Generated by Extension of the Lithosphere, *Journal of Petrology*, v 29, p 625-679, doi:10.1093/petrology/29.3.625, 1988.”

(The number following “v” is the volume number, if present. The “doi” is the ‘Digital Object Identifier’ and is present for most publications, but may be absent for some old works, but it’s still OK to cite them without this information.)

The references should be arranged in alphabetical order, based on the family name of the first author (i.e. ‘McKenzie’ in the above example).

Note that some journals now use a ‘paper number’ instead of a volume and paper number, and if so that information should be listed instead. References to books, technical reports or other sources should be listed in the most similar format possible, with enough information being provided to allow a reader to find the source you are referencing (e.g. name, publisher, date, author/editor, etc).

Appendix C – Digital Safety

One of the biggest risks you face when undertaking the projects and literature review is losing some of your work due to electronic device failure or damage, or lost notebooks or paper. Ensure you keep regular backups of all your work. If making notes on paper or in a notebook, consider using your phone to photograph your notes at the end of each day of work (which is standard practice during research fieldwork, and in other situations when loss of material is a danger).

Backups of electronic files can be made using a USB stick or an external hard drive. However, consider using an online tool (e.g. Dropbox, OneDrive, Google Docs, etc) to make real-time backups of your work. This second method has the advantage of not requiring you to remember to manually make a backup, and increases the regularity with which your work is secured.