

Syllabus

EART22001: Environmental Modelling

Semester 1 Lecture: Mondays 17:00-18:00

Semester 1 Practical: Tuesdays 13:00-15:00

Core module for:

- Environmental Science (PEP);
- Environmental Science (Atmospheric and Climate Science);
- Environmental Science (Ecology, Evolution and Conservation)

Optional for:

- Earth & Planetary Science (Geochemistry);
- Earth & Planetary Science (Planetary)

10 credits

Instructor

Prof. Paul Connolly

Centre for Atmospheric Science

Dept. of Earth, and Environmental Sciences

Simon Building, Room 3.08 (dial 63921 to be admitted)

paul.connolly@manchester.ac.uk

<http://www.manchester.ac.uk/research/paul.connolly/>

Phone: +44 (0)161 306 3921

Useful texts

See references at the back.

Assessment and Feedback

Assessment	Weighting
Online test 1 (available from 30 st October)	0%
Online test 2 (4 th December – 8 th December)	50%
Modelling Portfolio (essay, due 15 th December)	50%

See Appendix B for more detail. Feedback is available each week by speaking to the instructors in class. For the online assessments; however, if you feel you would like further clarification, please ask. That's why we're here!

Requirements

For 2023-2024 academic year this course will be delivered face-to-face. We would like to give you a first class experience of using advanced environmental models and this will involve hands on experience within the practical sessions.

At the time of writing the VPN is blocked for students to access the server from off-campus networks due to the recent cyber security issue at the UoM. However, you can still practise at home by installing Docker Desktop on your computer. This can work on Windows, Mac, or Chromebooks.

If you are accessing the server from on Campus you do not need to use Docker Desktop and you can log into the server using either CMD (on windows); terminal (on Mac); or the linux developer tools (on Chromebook).

Assessments on Blackboard

There is a webpage accompanying this module: http://personalpages.manchester.ac.uk/staff/paul.connolly/teaching/eart22001/eart22001_course.php?ver=2.0, where you can see the material for each week. The assessment links in week 6 and week 10 direct you straight to the Blackboard page for assessments, so you will need to input your University username and password (see Appendix B).

Portfolio presentation

This is an essay worth 50%. It will be submitted to Blackboard / TurnItIn. You will talk about particular modelling approaches that we will be learning about, and the advantages and disadvantages of a particular approach (see Appendix B).

Attendance

Attendance should be considered to be compulsory.

Feedback

You will get feedback on your work in several ways:

- By talking to us in class about your work.
- By completing the practical sessions and discussing your results during the practicals.
- I will also spend time in class covering general aspects of the assessments.

Appendix A

Units and conversions

A.1 Prefixes

Here are some prefixes that are often used when writing scientific numbers.

10	deka (da)	10^{-1}	deci (d)
10^2	hecta (h)	10^{-2}	centi (c)
10^3	kilo (k)	10^{-3}	milli (m)
10^6	mega (M)	10^{-6}	micro (μ)
10^9	giga (G)	10^{-9}	nano (n)
10^{12}	tera (T)	10^{-12}	pico (p)
10^{15}	peta (P)	10^{-15}	femto (f)
10^{18}	exa (E)	10^{-18}	atto (a)

Also note the unit Å (or Angstrom), often used to describe sizes of atoms, which is equal to 1×10^{-10} m.

Appendix B

Assessment for this course

Assessments are as follows:

- **Week 6 practice Blackboard assessment:** testing knowledge of the models used. This is a so-called *formative*, which does not count towards any grades, but will help you understand whether you are understanding the material.
 - Questions will probe your understanding of the models assumptions and the pros and cons of a particular modelling approach.
 - Questions will also probe your understanding of the questions that are asked within the practicals, which you will be answering as you go along.
 - The availability dates for this assessment on Blackboard are between: **Monday 30th October and Friday 15th December.**
- **Week 10 summative Blackboard assessment:** testing knowledge of the models used. This online test is the same format as the week 6 formative test; however, it will count for 50% of your grade for the course.
 - Questions asked will cover the material from all prior weeks.
 - The availability dates for this assessment on Blackboard are between: **Monday 4th December and Friday 8th December.**
- **Week 11 modelling essay assessment:** this is a 4-page written assignment, which is worth 50% of your grade.

The brief is for you to: 'discuss the use of an environmental modelling approach and its assumptions.'. You may set the scene by imagining you are either: (1) acting as environmental consultant and providing a lay-summary of a modelling approach for line-manager, or for a decision-maker; or (2) you are a scientist describing the use of modelling approach in a research paper.

 - You have already had practice at writing essays in your tutorials and other modules. The same principles apply to this essay.
 - It is not required, but you may use additional sources of literature (perhaps up to two) to help you with the discussion. Although this is not required it may help your essay be more distinct.
 - You may choose a particular modelling approach (used and described in a practical / lecture) and discuss the pros and cons of that approach.
 - You may also choose several models that can be used in a complementary way and describe how they link together and what they can be used to predict.

- You may use a maximum of 2 figures in your essay. You may use up to 5 pages, if required, and it should be at least 4 pages. The guide for word count is 1500-2000 words. Format the line-spacing so that it fits the page count.
- Note that the figures for the parcel model include 4 plots. These 4 plots can be counted as 1 figure.
- The emphasis is on describing the theory behind the model and explaining the assumptions in the model. You may include equations if you like, but this should not be the emphasis.
- Furthermore, the emphasis should not be on the technical details of running the model. If you read the methodology of any scientific paper describing a model you will see that they do not discuss these technical details.
- The assessment must be submitted via Blackboard by the deadline: **Friday 15th December.**

So there are two real deadlines in weeks 10 and 11.

It is strongly advised that you start planning the write-up of your essay well in advance. I would say to make a start on it from at least week 9, but this is an individual thing and others may need more time.

More information on the individual essay is provided on the next page.

Grade	Description
81% or more	Outstanding work. Carefully thought out title. Excellent language used; excellent formatting; labelled figures and appropriate captions; cross references, citations. Figures and captions that stand alone without the need for text. Critical judgement used.
70% —80%	First class Clear command of material, arguments and sources / citations. Clear understanding of underlying principles and a use of these principles in the discussion. Independent judgement on techniques used. Carefully thought out title. Most of the above formatting. Figures and captions that stand alone without the need for text.
60% —69%	Upper second class Good knowledge of material, arguments and original sources. Some relation between material and theory or grasp of principles. Some critique of techniques and approaches. Own title used. Most of the above formatting, with some potential issues (e.g. a few typographic errors)
50% —59%	Lower second class Generally correct knowledge of material. Correct summary and reasonably appropriate conclusions. Most of the above formatting, with some potential issues (e.g. a few typographic errors or missing cross-reference)
40% —49%	Third class Some knowledge of basic material. No clear conclusions drawn from the material, or conclusions are flawed or irrelevant. Some typos, missing cross references, no clear legends to figures. Written in note form, rather than full sentences. No citations to other sources.
1% —39%	Fail Basic material absent. Discussion flawed or fundamentally mistaken, or the use of language is so poor that the essay is incomprehensible.
0%	This mark is reserved for non-submission of due work. Or may be awarded in the case of plagiarism. Ensure you know what plagiarism is.