



## MODULE SPECIFICATION

<b>Academic Year (student cohort covered by specification)</b>	2023-24
<b>Module Code</b>	2607
<b>Module Title</b>	Methods in Climate Change and Planetary Health
<b>Module Organiser(s)</b>	Tony Carr, Marco Springmann and Pauline Scheelbeek
<b>Faculty</b>	EPH
<b>FHEQ Level</b>	Level 7
<b>Credit Value</b>	<b>CATS:</b> 10 <b>ECTS:</b> 5
<b>HECoS Code</b>	101317
<b>Term of Delivery</b>	Term 1
<b>Mode of Delivery</b>	Face to face
<b>Mode of Study</b>	Full-time
<b>Language of Study</b>	English
<b>Pre-Requisites</b>	None
<b>Accreditation by Professional Statutory and Regulatory Body</b>	None
<b>Module Cap (Indicative number of students)</b>	None
<b>Target Audience</b>	This module is compulsory for students on the MSc Climate Change and Planetary Health programme.
<b>Module Description</b>	<p>This module provides in-depth coverage of quantitative methods, models, and data analysis techniques relevant to climate change and planetary health research.</p> <p>The module includes sessions addressing the following topics:</p> <ul style="list-style-type: none"> <li>• Introduction to quantitative methods and models in planetary health research</li> <li>• Overview of planetary health drivers and impacts in modelling contexts.</li> <li>• Case studies demonstrating the application and limitations of models in planetary health topics (e.g., food systems, infectious diseases)</li> <li>• Analysis, interpretation, and communication of model outcomes</li> </ul>

	<ul style="list-style-type: none"> <li>Uncertainty in modelling and its implications for research and policy</li> </ul>
<b>Duration</b>	10 weeks at approximately 0.5 days per week contact hours and approximately 0.5 day per week self-study
<b>Timetabling slot</b>	Term 1
<b>Last Revised (e.g. year changes approved)</b>	N/A

<b>Programme(s)</b>	<b>Status</b>
This module is linked to the following programme(s)	
MSc Climate Change and Planetary Health	<b>Compulsory</b>

## Module Aim and Intended Learning Outcomes

<b>Overall aim of the module</b>
The overall module aim is to equip students with in-depth knowledge of quantitative methods and models in climate change and planetary health research, as well as transferable skills related to data analysis and management for various research contexts and topics within the field of climate change & planetary health.
<b>Module Intended Learning Outcomes</b>
<p>Upon successful completion of the module a student will be able to:</p> <ol style="list-style-type: none"> <li>Discuss and explain methods and modelling tools for planetary health research, including their strengths and limitations, from disciplines related to planetary health</li> <li>Apply modelling tools, datasets, and scenarios to analyse the interactions between environmental, socio-economic, and health impacts</li> <li>Create model scenarios to analyse the impact on the environment of climate change adaptation and mitigation strategies, as well as their potential co-benefits and/or co-harms for population health</li> <li>Interpret findings from quantitative analyses, including uncertainties and present these findings in a clear, concise, and logical manner for various target audiences.</li> <li>Appraise research projects in the fields of climate change and planetary health</li> </ol>

## Indicative Syllabus

### Session Content

The module addresses topics crucial to understanding and applying models in planetary health through a combination of lectures, seminars, and practical sessions.

Lectures and seminars will:

1. Introduce quantitative methods and models in planetary health research
2. Describe examples of planetary health drivers and impacts that can be modelled, including in the fields of energy, transportation, the built environment, food systems, and air pollution
3. Discuss example modelling topics to demonstrate practical aspects of models, their limitations, uncertainties, and scenario development

Practical sessions will:

1. Give students some hands-on experience with applying techniques for modelling climate change and health impacts using common models and databases (including those from infectious disease modelling)
2. Provide an opportunities for students to apply techniques for modelling environmental footprints and health impacts using common models and databases (including those from food systems modelling)

## Teaching and Learning

### Notional Learning Hours

Type of Learning Time	Number of Hours	Expressed as Percentage (%)
Contact time	20	20%
Directed self-study	25	25%
Self-directed learning	25	25%
Assessment, review and revision	30	30%
<b>Total</b>	<b>100</b>	<b>100%</b>

### Teaching and Learning Strategy

Teaching consists of ten half-day face-to-face sessions generally comprised of lectures, practical sessions and seminar/group activities, including carefully constructed exercises and discussion in the practical sessions; guided reading; case studies and critical appraisal of research project (through individual, group and class work). Students are expected to prepare for lectures and seminars outside of these hours.

### Assessment

#### Assessment Strategy

The assessment for this module has been designed to measure student learning against the module intended learning outcomes (ILOs) as listed above. The summative assessment will be undertaken on completion of the module at the end of term 1.

Formative assessment methods, including group work and presentations, will be used to measure students' progress during the module.

The summative assessment for this module will be a scientific report analysing and interpreting the data from model outputs. Students will be given a dataset of model outputs and tasked with analysing the data using skills acquired during the course. They will discuss uncertainties or limitations and develop evidence-based policy recommendations while considering implications for stakeholders and policymakers.

### Summative Assessment

Assessment Type	Assessment Length (i.e. Word Count, Length of presentation in minutes)	Weighting (%)	Intended Module Learning Outcomes Tested
Report	2500 words	100	1-5

#### Resitting assessment

Resits will accord with the LSHTM's [Resits Policy](#)

For individual students resitting a group assessment there will be an approved alternative assessment as detailed below.



## Resources

### Indicative reading list (if applicable)

#### On planetary health:

- Whitmee, S. *et al.* Safeguarding human health in the Anthropocene epoch: report of The Rockefeller Foundation-Lancet Commission on planetary health. *The Lancet* **386**, 1973–2028 (2015).
- Riaz, M. M. A., Wangari, M.-C. & Mugambi, J. K. No climate change justice in lieu of global authorship equity. *The Lancet* **401**, 1074 (2023).

#### On food systems:

- Willett, W. *et al.* Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems. *The Lancet* **393**, 447–492 (2019).
- Springmann, M. *et al.* Options for keeping the food system within environmental limits. *Nature* **562**, 519–525 (2018).

#### On modelling of health impacts of dietary change:

- Springmann, M. *et al.* The healthiness and sustainability of national and global food based dietary guidelines: modelling study. *BMJ* **370**, m2322 (2020).
- GBD 2017 Diet Collaborators *et al.* Health effects of dietary risks in 195 countries, 1990–2017: a systematic analysis for the Global Burden of Disease Study 2017. *The Lancet* **0**, (2019).

#### On air pollution

- J. Lelieveld, K. Klingmüller, A. Pozzer, R. T. Burnett, A. Haines, and V. Ramanathan. Effects of fossil fuel and total anthropogenic emission removal on public health and climate. *PNAS*, 25 March 2019. <https://doi.org/10.1073/pnas.1819989116>
- Manisalidis, I., Stavropoulou, E., Stavropoulos, A. & Bezirtzoglou, E. Environmental and Health Impacts of Air Pollution: A Review. *Frontiers in Public Health* **8**, (2020).

#### On climate change impacts on agriculture

- Jägermeyr, J., Müller, C., Ruane, A.C. *et al.* Climate impacts on global agriculture emerge earlier in new generation of climate and crop models. *Nat Food* **2**, 873–885 (2021). <https://doi.org/10.1038/s43016-021-00400-y>
- Rosenzweig, C. *et al.* Coordinating AgMIP data and models across global and regional scales for 1.5°C and 2.0°C assessments. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences* **376**, 20160455 (2018).

#### On learning programming with R

- R for Data Science: Import, Tidy, Transform, Visualize, and Model Data



<https://r4ds.had.co.nz/> - free to view online

- RStudio Cheatsheets inc Data Visualization with ggplot2

<https://posit.co/resources/cheatsheets/> - free to download online

## Teaching for Disabilities and Learning Differences

The module-specific site on Moodle will provide students with access to lecture notes and copies of the slides used during the lecture prior to the lecture in accessible formats (Word/PDF and PPT/PDF). All lectures will be recorded and made available on Moodle.

The LSHTM Moodle has been made accessible to the widest possible audience, using a VLE that allows for up to 300% zoom, permits navigation via keyboard and use of speech recognition software, and that allows listening through a screen reader. All students have access to "SensusAccess" software which allows conversion of files into alternative formats.

The module will provide additional support for students with disabilities and learning differences in accordance with the Student Support Services section of the Student Handbook.