MODULE SPECIFICATION

Academic Year (student cohort covered by specification)	2024-25
Module Code	2492
Module Title	Genomics Health Data
Module Organiser(s)	Julián Villabona-Arenas and Stéphane Hué
Faculty	Epidemiology and Population Health
FHEQ Level	Level 7
Credit Value	CATS: **15** ECTS: **7.5**
HECoS Code	100901
Term of Delivery	Term 2
Mode of Delivery	For the academic year 2024-25, this module will be delivered live face-to-face. If, due to exceptional circumstances, a session cannot be delivered in person, it will be taught online. Most sessions in this module will comprise an introductory lecture, followed by a practical session on the same topic. Some sessions will be entirely practical.
Mode of Study	Full-time
Language of Study	English
Pre-Requisites	None, over and above those for the programme MSc Health Data Science. Familiarity with R and basic batch commands is strongly recommended.
Accreditation by Professional Statutory and Regulatory Body	None
Module Cap (indicative number of students)	20 students max.
Target Audience	Recommended for students taking MSc Health Data Science.
Module Description	This module introduces genomic health data (e.g. pathogen genome sequences and human genetic markers) and its applications in health research.
Duration	5 weeks at 2 days per week
Timetabling slot	D1

Last Revised (e.g. year changes approved)	August 2022

Programme(s) This module is linked to the following programme(s)	**Status**
MSc Health Data Science	Recommended

Module Aim and Intended Learning Outcomes

Overall aim of the module
The overall module aim is to provide a solid understanding of fundamental conceptsin genetics and genomics, along with an introduction to genomic data analysis techniques used in health research.

Module Intended Learning Outcomes
Upon successful completion of the module, a student will be able to: 1. Appraise the fundamental concepts of genetics and genomics. 2. Examine the computational, statistical, and analytical methods relevant to genetic and genomic data. 3. Critically assess the design, analysis, and results of genomic data research approaches. 4. Appraise the ethical, legal, and social implications of genomic data research.

Indicative Syllabus

Session Content
The module is expected to cover the following topics: • Introduction to genomics • Genomic data generation and handling • Pathogen genomics and phylogenetics • Disease outbreak analysis • Genome-wide association studies, mendelian randomization, and polygenic risk scores • Ethics of genomic data usage

Teaching and Learning

Notional Learning Hours

Type of Learning Time	Number of Hours	Expressed as Percentage (%)
Contact time	40	27
Directed self-study	50	33
Self-directed learning	40	27
Assessment, review and revision	20	13
Total	**150**	**100**

Student contact time refers to the tutor-mediated time allocated to teaching, provision of guidance and feedback to students. This time includes activities that take place in face-to-face contexts such as lectures, seminars, demonstrations, tutorials, supervised laboratory workshops, practical classes, project supervision as well as where tutors are available for one-to-one discussions and interaction by email.

The division of notional learning hours listed above is indicative and is designed to inform students as to the relative split between interactive and self-directed study.

Teaching and Learning Strategy
Each session will cover a specific topic in genetics or genomics. Most of these sessions will include a practical component wherein theoretical concepts are applied. The practical parts will involve either guided hands-on data analysis or paper discussions. Some sessions may necessitate the prior study of specific materials and/or the installation of specific software.

Assessment

Assessment Strategy
Most sessions will include formative assessments, including quizzes and group discussions. These will involve multiple choice and short answer questions, representative to those in the summative assessment. The summative assessment will be an in-person, invigilated, open book exam. It comprises multiple-choice questions (50% of the grade) and short-answer questions (50%), with some questions requiring the application of analyses taught during the course.

Summative Assessment

Assessment Type	Assessment Length (i.e. Word Count, Length of presentation in minutes)	Weighting (%)	Intended Module Learning Outcomes Tested
Timed Test	120 minutes	100	1- 4

Resitting assessment
Resits will accord with Chapter 8a of the LSHTM Academic Manual. The resit will be an open book exam in the same format as the summative assessment (i.e. MCQs and short answer questions).

Resources

Key papers and/or online resources (e.g. tutorials and educative content) will be given for each session.

Teaching for Disabilities and Learning Differences

The module-specific site on Moodle gives students access to lecture notes and copies of the slides used during the lecture. Where appropriate, lectures are recorded and made available on Moodle. All materials posted on Moodle, including computer-based sessions, have been made accessible where possible.

LSHTM Moodle is accessible to the widest possible audience, regardless of specific needs or disabilities. More detail can be found in the Moodle Accessibility Statement which can also be found within the footer of the Moodle pages. All students have access to "SensusAccess" software which allows conversion of files into alternative formats.

Student Support Services can arrange learning or assessment adjustments for students where needed. Details and how to request support can be found on the LSHTM Disability Support pages.