MODULE SPECIFICATION

Academic Year (student cohort covered by specification)	2021-22
Module Code	2486
Module Title	Programming
Module Organiser(s)	Antonio Gasparrini and Nicholas Furnham
Faculty	Epidemiology & Population Health
FHEQ Level	Level 7
Credit Value	**CATS:** 10 **CATS:** 5
HECoS Code	100956
Term of Delivery	Term 1
Mode of Delivery	For 2021-22 this module will be delivered online. Where specific teaching methods (lectures, seminars, discussion groups) are noted in this module specification these will be delivered using an online platform. There will be a combination of live and interactive activities (synchronous learning) as well as recorded or self-directed study (asynchronous learning).
Mode of Study	Full-time
Language of Study	English
Pre-Requisites	None, over and above the pre-requisites for the programme MSc Health Data Science
Accreditation by Professional Statutory and Regulatory Body	None
Module Cap (indicative number of students)	33 (numbers may be capped due to limitations in facilities or staffing)
Target Audience	This module is compulsory for the MSc Health Data Science
Module Description	An introduction to the concepts and practicalities of programming as implemented in two popular programming languages, Python and R.
Duration	15 x 0.5 day sessions
Timetabling slot	Term 1
Last Revised (e.g. year changes approved)	September 2020

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

Module Aim and Intended Learning Outcomes

Overall aim of the module
The overall module aim is to: • introduce students to the concepts and practicalities of programming in Python and R.

Module Intended Learning Outcomes
Upon successful completion of the module a student will be able to: 1. critically evaluate the strengths and limitations of R and Python; 2. examine the core features of good programming practice and implement them in both R and Python; 3. devise solutions to complex programming problems using help facilities and on-line resources in R and Python; 4. analyse the steps needed to solve a given programming problem and construct programs to address the problem using both R and Python.

Indicative Syllabus

Session Content
The module is expected to cover the following topics: • An introduction to the general concepts of programming. • An introduction to the statistical package R. • An introduction to Python programming language.

Teaching and Learning

Notional Learning Hours

Type of Learning Time	Number of Hours	Expressed as Percentage (%)
Contact time	40	40
Directed self-study	30	30
Self-directed learning	20	20
Assessment, review and revision	10	10
Total	**100**	**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. Student contact time also includes tutor-mediated activities that take place in online environments, which may be synchronous (using real-time digital tools such as Zoom or Blackboard Collaborate Ultra) or asynchronous (using digital tools such as tutor-moderated discussion forums or blogs often delivered through the School's virtual learning environment, Moodle).

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 consist of a series of short presentations followed by supervised computer work. The computer work will involve material that the students can work through at their own pace during each session followed by exercises.

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. Formative assessment methods are used to measure students' progress. The grade for summative assessment(s) only will go towards the overall award GPA. The assessment for this module in term 1 will be online. The summative assessment will be via an individual assignment to re-write and extend one of the example exercises in R and implement it in Python. The assessment will be marked based on both the quality of the written code as well as the successful implementation of the assignment. Formative assessment provided by individual feedback during the supervised computer work sessions. These sessions will explore the example exercise that the summative assessment is based on.

Summative Assessment

Assessment Type	Assessment Length (i.e. Word Count, Length of presentation in minutes)	Weighting (%)	Intended Module Learning Outcomes Tested
Coursework	~200 lines of python code and documentation	100	1 – 4

Resitting assessment
Resits will accord with the LSHTM's Resits Policy

Resources

Indicative reading list
Data Science from Scratch: First Principles with Python, Joel Grus, O'Reilly, 2nd Ed.

Population Health Data Science with R. Transforming data into actionable knowledge, Tomas J Aragon. [Free online] https://bookdown.org/medepi/phds/

Other resources
Module information, including timetables, lecture notes, practical instructions and key literature for each session will be made available via the Virtual Learning Environment (Moodle).

Teaching for Disabilities and Learning Differences

All module information, including example datasets and practical instructions, will be made available on the Virtual Learning Environment (Moodle) in advance of each session. Materials will be checked for accessibility following the LSHTM Technology Enhanced Learning guidance.

The module-specific site on Moodle provides students with access to lecture notes and copies of the slides used during the lecture prior to the lecture (in pdf format). All lectures are recorded and made available on Moodle as quickly as possible. All materials posted up on Moodle areas, including computer-based sessions, have been made accessible where possible.

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.

For students who require learning or assessment adjustments and support this can be arranged through the Student Support Services – details and how to request support can be found on the LSHTM Disability Support pages.