

MSc Epidemiology

This document provides a definitive record of the main features of the programme and the learning outcomes that a typical student may reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities provided. This programme specification is primarily intended as a reference point for academic and support staff involved in delivering the programme and enabling student development and achievement, for its assessment by internal and external examiners, and in subsequent monitoring and review.

Programme Information			
Award(s)	MSc		
Programme Title	Epidemiology		
Programme code	A3BF		
Awarding Institution	Imperial College London		
Teaching Institution	Imperial College London		
Faculty	Faculty of Medicine		
Department	School of Public Health		
Associateship	n/a		
Mode and Period of Study	1 calendar year, full-time (12 months)		
Cohort Entry Points	Annually in October		
Relevant QAA Benchmark Statement(s) and/or other external reference points	Master's Degrees in Medicine		
Total Credits	ECTS:	90	UK Credits: 180
FHEQ Level	Level 7 - Master's		
EHEA Level	2 nd cycle		
External Accrator(s)	None		
Specification Details			
Student cohorts covered by specification	2021-22		
Person Responsible for the specification	Jo Tite j.tite@imperial.ac.uk		
Date of introduction of programme	2017-18		
Date of programme specification/revision	September 2021		

Description of Programme Contents

The MSc in Epidemiology offers a thorough grounding in epidemiological research and the application of statistical and mathematical methods to epidemiological investigation and practice. Students will be given the opportunity to apply research techniques to a variety of challenging epidemiological and biomedical problems.

The programme is an intensive full-time programme requiring active study for a full 12 months.

Term One

The core focus of term one is to lay the foundations in biostatistics, modelling and epidemiologic study design and analysis. It will build core knowledge on methods in epidemiology and major disease, skills in the application of these and avenues of epidemiological research.

The programme is comprised of four core modules in term one, as follows:

- Introduction to Statistical Thinking and Data Analysis;
- Principles and Methods of Epidemiology;
- Research Methods;
- Introduction to Infectious Disease Modelling.

Term Two

The core focus of term two is to develop more specialised methodological and analytic skills, with the development of knowledge on advanced methods and skills, and the application thereof used in conduct of epidemiological research.

Term two builds upon the knowledge gained in term one and allows students to choose six out of eight available optional/elective modules. The selection of optional/elective modules has been carefully designed to cover a range of topics important for epidemiologic analyses and allow a certain degree of specialism, whilst ensuring that students gain skills across a broad range of topics related to infectious and chronic disease epidemiology.

The optional/elective modules are subject to change each year but currently include:

- Bayesian modelling for spatial and spatio-temporal data (merged with Spatial Analysis module and modified to suit developments in theory and best practice)
- Further Methods in Infectious Disease Modelling (Pre-requisite for 'Outbreaks' module)
- Outbreaks
- Advanced Regression
- Emerging and Neglected Tropical Diseases
- Molecular and Genetic Epidemiology
- Genetics of Infectious Disease Pathogens

Term 3

From approximately May until September (4 months), the research project will be carried out.

The titles of the research projects are offered by prospective supervisors each year and will be made available before the start of term two for students to select from. Students may be able to initiate and propose their own research projects, subject to internal academic approval, appropriate supervision available and ethical approval requirements.

Example and indicative projects from previous years include:

- Predicting the public health impact of pyrethroid resistance for malaria control;
- Epigenetic aging of the female X chromosome;
- Umbrella review and meta-analysis of white cell counts as predictors of disease;
- Origins of data amongst mathematical models of tuberculosis;
- Infectious disease risk assessment under a changing climate: phenological environmental suitability modelling for invertebrate disease vectors;
- Systematic review and meta-analysis of circulating vitamin D in critically ill adult and paediatric patients.

On completion of the project, a written dissertation will be produced and submitted for examination followed by a viva in September with an internal and external examiner.

Students are expected to attend ALL timetabled sessions and any additional practical classes, tutorials and group-work meetings. The attendance requirement is full-time i.e. usual working hours from Monday - Friday for the taught components and for the research project.

Learning Outcomes

By the end of the programme, students should be able to:

1. Design, analyse, interpret, and criticise epidemiological and biomedical research;
2. Demonstrate an understanding of the essential principles of modern biostatistical methods and how to apply them;
3. Identify key concepts in the ecology and evolutionary biology of infectious disease and propose solutions to apply them to real world, cotemporary problems;
4. Employ basic mathematical and computational skills used in the analysis of infectious disease pathogenesis, transmission and control;
5. Apply current research methods in key areas of their chosen specialism;
6. Identify problems and pose appropriate studies/solutions;
7. Demonstrate an understanding and apply principles of modelling to real world and contemporary health problems;
8. Understand and provide an overview of the big issues in chronic and infectious disease epidemiology;
9. Carry out research using research methods to generate novel scientific results;
10. Communicate scientific results in a formal setting to an audience of peers and engage in scientific dialogue;
11. Integrate information from a range of sources.

The Imperial Graduate Attributes are a set of core competencies which we expect students to achieve through completion of any Imperial College degree programme. The Graduate Attributes are available at: <https://www.imperial.ac.uk/students/academic-support/graduate-attributes/>

Entry Requirements	
Academic Requirement	2.1 Honours degree in mathematics or statistics, medicine (human and veterinary) or biological sciences.
Additional Requirements	None.
Some applicants may be invited to a post-application interview (over phone or Skype) to further assess the suitability of the application, and demonstrate an exceptional background, level of experience or demonstrable drive towards public health research or action.	
English Language Requirement	Higher Requirements: IELTS 7 with a minimum of 6.5 in each element or equivalent
The programme's competency standards documents can be found at: http://www.imperial.ac.uk/medicine/study/postgraduate/masters-programmes/msc-epidemiology/	
Learning & Teaching Strategy	
Scheduled Learning & Teaching Methods	<ul style="list-style-type: none"> • Lectures • Seminars and practicals • Class tutorials • Small group tutorials • Group work sessions • Computer based practical workshops • Group revision sessions
E-learning & Blended Learning Methods	<ul style="list-style-type: none"> • Coursera • Microsoft Office, Teams and integrated apps • Blackboard • Zoom
Project and Placement Learning Methods	<ul style="list-style-type: none"> • Final research project (dissertation)
Assessment Strategy	
Assessment Methods	<ul style="list-style-type: none"> • Written examinations • Essays • Reports and paper reviews • MCQs and online quizzes • Mini research project • Individual and group presentations • Video blogs • Articles and case study reviews
Academic Feedback Policy	
The programme complies with the College policy and will provide students with feedback within a timely and appropriate turnaround time. Students will be provided with a bespoke assessment	

schedule confirming all submission deadlines, marking periods and feedback points to manage their expectations and ensure feedback can inform the next assessment, where appropriate.

Feedback will take different forms depending on the type of assessment:

- Exams and written reports: students will be given written feedback, and given the opportunity to discuss their provisional marks;
- Oral presentations: comments and immediate feedback will be given during some presentations, and feedback shall be provided once provisional marks are published;
- Final research project: students will be given written feedback for their final project/presentation and also receive preliminary oral feedback following the oral presentation.

Further exchanges will also take place throughout the programme through:

- Questions during or after the lectures;
- Interaction with tutors during practicals and one-to-one sessions;
- Support and academic advice provided by the Course Organisers.

Re-sit Policy

Students will be permitted to re-enter a failed examination or resubmit a piece of failed coursework on a single occasion. Examination re-sits may only be available at the next available sitting (i.e. in the next following academic year).

Mitigating Circumstances Policy

The College's Policy on Mitigating Circumstances is available at: www.imperial.ac.uk/registry/exams

Programme Structure

Full-time	Term One	Term Two	Term Three
Core Modules	4	0	0
Elective Modules	0	Up to 6	0
Projects	0	0	1

Assessment Dates & Deadlines

Written Examinations	End of Term 1 modules (December) End of Term 2 modules (April/May)
Coursework Assessments	Continuous
Project Deadlines	End of Term 1 modules (January) Term 3 research project (Late August)
Practical Assessments	Continuous Research Project Oral Viva (Mid/late September)

Assessment Structure

Programme Component	ECTS	% Weighting
Introduction to Statistical Thinking and Data Analysis	7.5	8.3%
Principles and Methods of Epidemiology	7.5	8.3%
Research Methods	7.5	8.3%
Foundations of Public Health Practice	7.5	8.3%
<u>Choice of five or six elective/optional modules:</u>	Total of 30	33.3%
<ul style="list-style-type: none"> Bayesian modelling for spatial and spatio-temporal data 	10	
<ul style="list-style-type: none"> Further Methods in Infectious Disease Modelling (Pre-reg of 'Outbreaks') Outbreaks Advanced Regression Emerging and Neglected Tropical Diseases Molecular and Genetic Epidemiology Genetics of Infectious Disease Pathogens 	5 each	
Research Project	30	33.3%
Total	90	100%

Marking Scheme

The MSc can be awarded as a Pass, Merit or Distinction.

In order to be awarded a **Pass for the Masters award**, a student must:

- Achieve a mark of at least 40% in each assessment
- Achieve an aggregate pass mark of at least 50% in each module
- Students may be condoned in a maximum of 15 ECTS for the Masters award (i.e. excluding the Research Project) with an aggregate mark of at least 40% in each module providing the overall aggregate mark for the programme is at least 50%
- Achieve a mark of at least 50% in the Research Project

In order to be awarded a **Merit for the Masters award**, a student must:

- Achieve a mark of at least 40% in each assessment
- Achieve an aggregate mark of at least 60% in each module
- Students may be condoned in a maximum of 15 ECTS for the Masters award (i.e. excluding the Research Project) with an aggregate mark of at least 40% in each module providing the overall aggregate mark for the programme is at least 60%
- Achieve a mark of at least 60% in the Research Project

In order to be awarded a **Distinction for the Masters award**, a student must:

- Achieve a mark of at least 40% in each assessment
- Achieve an aggregate pass mark of at least 70% in each module
- Students may be condoned in a maximum of 15 ECTS for the Masters award (i.e. excluding the Research Project) with an aggregate mark of at least 40% in each module providing the overall aggregate mark for the programme is at least 70%
- Achieve a mark of at least 70% in the Research Project

Exit awards

A student may be permitted to exceptionally exit with one of the following lower awards, subject to exam board approval:

- A **Postgraduate Certificate** (upon passing and completing the four core modules during term one) totalling 30 ECTS modules, subject to exam board approval. The modules required are:
 - Introduction to Statistical Thinking and Data Analysis(7.5ECTS)
 - Principles and Methods of Epidemiology(7.5ECTS)
 - Research Methods (7.5ECTS)
 - Introduction to Infectious Disease Modelling (7.5ECTS)
- A **Postgraduate Diploma** (upon passing and completing the first four core modules during term one, and, six optional modules from term totalling 60 ECTS modules, subject to exam board approval. The modules required are those detailed above, and:
 - Any elective modules totalling 30 ECTS (5 or 10 ECTS each)

In order to be awarded a **Pass for the PG Cert or PG Dip exit award**, a student must:

- Achieve a mark of at least 40% in each assessment
- Achieve an aggregate pass mark of at least 50% in each module

In order to be awarded a **Merit for the PG Cert or PG Dip exit award**, a student must:

- Achieve a mark of at least 40% in each assessment
- Achieve an aggregate mark of at least 60% in each module

In order to be awarded a **Distinction for the PG Cert or PG Dip exit award**, a student must:

- Achieve a mark of at least 40% in each assessment
- Achieve an aggregate pass mark of at least 70% in each module

Indicative Module List												
Code	Title	Core/ Elective	Year	L&T Hours	Ind. Study Hours	Place- ment Hours	Total Hours	% Written Exam	% Course- work	% Practical	FHEQ Level	ECTS
PUBH97052	Introduction to Statistical Thinking and Data Analysis	Core	1	50	137.5	0	187.5	40	40	20	7	7.5
PUBH97002	Principles and Methods of Epidemiology	Core	1	35	152.5	0	187.5	35	65	0	7	7.5
PUBH97014	Research Methods	Core	1	60	127.5	0	187.5	0	65	35	7	7.5
PUBH97017	Introduction to Infectious Disease Modelling	Core	1	42	145.5	0	187.5	50	50	0	7	7.5
PUBH97063	Bayesian modelling for spatial and spatio-temporal data	Elective	1	50	200	0	250	50	30	20	7	10
PUBH97020	Further Methods in Infectious Disease Modelling	Elective	1	25	100	0	125	0	100	0	7	5
PUBH97021	Outbreaks	Elective	1	25	100	0	125	0	80	20	7	5
PUBH97022	Advanced Regression	Elective	1	25	100	0	125	100	0	0	7	5
PUBH97053	Emerging and Infectious Neglected Tropical Diseases	Elective	1	30	95	0	125	75	25	0	7	5
PUB97025	Genetics of Infectious Disease Pathogens	Elective	1	30	95	0	125	100	0	0	7	5
PUB97026	Research Project	Core	1	25	725	0	750	0	90	10	7	30

Supporting Information

The Programme Handbook is available at:

<http://www.imperial.ac.uk/medicine/study/postgraduate/masters-programmes/msc-epidemiology/>

The College's entry requirements for postgraduate programmes can be found at:

www.imperial.ac.uk/study/pg/apply/requirements

The College's Quality & Enhancement Framework is available at:

www.imperial.ac.uk/registry/proceduresandregulations/qualityassurance

The College's Academic and Examination Regulations can be found at:

<http://www3.imperial.ac.uk/registry/proceduresandregulations/regulations>

Imperial College is an independent corporation whose legal status derives from a Royal Charter granted under Letters Patent in 1907. In 2007 a Supplemental Charter and Statutes was granted by HM Queen Elizabeth II. This Supplemental Charter, which came into force on the date of the College's Centenary, 8th July 2007, established the College as a University with the name and style of "The Imperial College of Science, Technology and Medicine".

<https://www.imperial.ac.uk/admin-services/secretariat/college-governance/charters/charter-and-statutes/>

Imperial College London is regulated by the Higher Education Funding Council for England (HEFCE)

<http://www.hefce.ac.uk/reg/of/>

TERM 1												
Week beginning	05-Oct	12-Oct	19-Oct	26-Oct	2-Nov	9-Nov	16-Nov	23-Nov	30-Nov	7-Dec	14-Dec	21-Dec/ 4-Jan
	WEEK 1	2	3	4	5	6	7	8	9	10	11	12 - 14
Monday	Induction	Intro to Statistical Thinking and Data Analysis (Core 7.5 ECTS)										Independent Study and assessment preparation
Tuesday		Principles and Methods of Epidemiology (Core 7.5 ECTS)										
Wednesday am		Disease Masterclass seminar series										
Wednesday pm		Extracurricular activities/ optional maths/ independent study										
Thursday		Module 3: Research Methods (Core 7.5 ECTS)										
Friday		Module 4: Introduction to Infectious disease Modelling (7.5 ECTS)										
TERM 2 – all students choose 5 or 6 out of the 9 modules on offer to make up a total of 30 ECTS												
NOTE: Further Methods in Infectious Disease Modelling [FIDM] is a pre-requisite for the Outbreaks module												
	11-Jan	18-Jan	25-Jan	1-Feb	8-Feb	15-Feb	22-Feb	1-Mar	8-Mar	15-Mar	22-Mar	29-Mar / 26-Apr
	15	16	17	18	19	20	21	22	23	24	25	26 - 30
Monday	Exam week 1/ IndStudy	Bayesian modelling for spatial and spatio-temporal data (combination of above): 10 ECTS										Independent study and Assessment preparation
Tuesday		Emerging and Neglected Tropical Diseases: 5 ECTS					Advanced Regression: 5 ECTS					
Wednesday AM/ PM		Independent Study and assessment preparation										
Thursday		Further Methods in Infectious Disease Modelling [FIDM] (pre-requisite for Outbreaks module): 5 ECTS					Outbreaks: 5 ECTS (FIDM required as pre-requisite)					
Friday		Molecular and Genetic Epidemiology: 5 ECTS					Genetics of Infectious Disease Pathogens: 5 ECTS					
Week beginning		3-May	10-May	17-May	24-May	31-May	7-Jun	14-Jun / 30-Aug				
	31	32	33	34	35	36	37 - 48					49 - 52
TERM 3	Exam week 2	Research Project Planning, optional project skills					Module 8: Full time Research Project (Core 30 ECTS)					Dissertation submission and oral exam