

MSc in 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 | Masters 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 | 2017-18 | | | |
| Person Responsible for the specification | Jo Tite j.tite@imperial.ac.uk | | | |
| Date of introduction of programme | October 2017 | | | |
| Date of programme specification/revision | 25 th April 2017 | | | |

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;
- Disease Masterclass;
- 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 Statistics (Pre-requisite for 'Spatial Analysis' module)
- Spatial Analysis
- Further Methods in Infectious Disease Modelling (Pre-requisite for 'Outbreaks' module)
- Outbreaks
- Advanced Regression
- Advanced Topics in Biostatistics
- 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: www.imperial.ac.uk/students/academic-support/graduate-attributes

Entry Requirements

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| Academic Requirement | 2.1 Honours degree in mathematics or statistics, medicine (human and veterinary) or biological sciences. |
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| Additional Requirements | None. |
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Some applicants may be invited to a post-application interview (over the phone or by Skype) to further assess the suitability of the application, and demonstrate an exceptional background and level of experience pertinent to work experience or demonstrable drive towards epidemiology and public health research or action.

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| English Language Requirement | Higher Requirements: IELTS 7 with a minimum of 6.5 in each element or equivalent |
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The programme's core competency standards documents can be found at: <http://www.imperial.ac.uk/medicine/study/postgraduate/masters-programmes/msc-epidemiology/>

Learning & Teaching Strategy

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|---------------------------------------|---|
| 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 workshops and revision sessions |
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| E-learning & Blended Learning Methods | <ul style="list-style-type: none"> • Formative and summative assessment via Blackboard e.g. in-class quizzes • Mentimeter • Teaching materials published via Blackboard |
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| Project and Placement Learning Methods | <ul style="list-style-type: none"> • Final research project (dissertation) |
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Assessment Strategy

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|--------------------|--|
| Assessment Methods | <ul style="list-style-type: none"> • Written examinations • Essays • Reports and paper reviews • Computer based tests • MCQs and online quizzes • Mini research project • Individual and group presentations • Articles and case study reviews |
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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 according to 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 provided once provisional marks are published;
- Final research project: students be will 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 1-2-1s;
- 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. the 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 | 6 | 0 |
| Projects | 0 | 0 | 1 |

Assessment Dates & Deadlines

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|------------------------|---|
| Written Examinations | End of Term 1 modules (January) End of Term 2 modules (April/May) |
| Coursework Assessments | Continuous |
| Project Deadlines | End of Term 1 modules (February) Term 3 research project (Early September) |

| Practical Assessments | Continuous Research Project Oral (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% |
| Introduction to Infectious Disease Modelling | 7.5 | 8.3% |
| Disease Masterclass | 7.5 | 8.3% |
| <u>Choice of six elective/optional modules:</u> <ul style="list-style-type: none"> • Bayesian Statistics (Pre-req of 'Spatial Analysis') • Spatial Analysis • Further Methods in Infectious Disease Modelling (Pre-reg of 'Outbreaks') • Outbreaks • Advanced Regression • Advanced Topics in Biostatistics • Molecular and Genetic Epidemiology • Genetics of Infectious Disease Pathogens | 30 (5 each) | 33.3% (5.5% each) |
| Research Project | 30 ECTS | 33.3% |
| Total | 90 | 100% |
| Marking Scheme | | |
| <p>The MSc can be awarded as a Pass, Merit or Distinction.</p> <p>In order to be awarded a Pass for the Masters award, a student must:</p> <ul style="list-style-type: none"> • 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 <p>In order to be awarded a Merit for the Masters award, a student must:</p> <ul style="list-style-type: none"> • 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**, 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

Admission and entrance to the programme is for the full-time MSc programme only.

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 (7.5 ECTS)
 - Principles and Methods of Epidemiology (7.5 ECTS)
 - Disease Masterclass (7.5 ECTS)
 - Introduction to Infectious Disease Modelling (7.5 ECTS)
- 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 6 x elective modules totalling 30 ECTS (5 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 |
| TBC | Introduction to Statistical Thinking and Data Analysis | Core | 1 | 45 | 142.5 | 0 | 187.5 | 80 | 20 | 0 | 7 | 7.5 |
| TBC | Principles and Methods of Epidemiology | Core | 1 | 35 | 152.5 | 0 | 187.5 | 60 | 40 | 0 | 7 | 7.5 |
| TBC | Disease Masterclass | Core | 1 | 60 | 127.5 | 0 | 187.5 | 0 | 100 | 0 | 7 | 7.5 |
| TBC | Introduction to Infectious Disease Modelling | Core | 1 | 42 | 145.5 | 0 | 187.5 | 100 | 0 | 0 | 7 | 7.5 |
| TBC | Bayesian Statistics | Elective | 1 | 25 | 100 | 0 | 125 | 0 | 100 | 0 | 7 | 5 |
| TBC | Spatial Analysis | Elective | 1 | 25 | 100 | 0 | 125 | 0 | 100 | 0 | 7 | 5 |
| TBC | Further Methods in Infectious Disease Modelling | Elective | 1 | 25 | 100 | 0 | 125 | 0 | 100 | 0 | 7 | 5 |
| TBC | Outbreaks | Elective | 1 | 25 | 100 | 0 | 125 | 0 | 80 | 20 | 7 | 5 |
| TBC | Advanced Regression | Elective | 1 | 25 | 100 | 0 | 125 | 100 | 0 | 0 | 7 | 5 |
| TBC | Advanced Topics in Biostatistics | Elective | 1 | 30 | 95 | 0 | 125 | 0 | 100 | 0 | 7 | 5 |
| TBC | Molecular and Genetic Epidemiology | Elective | 1 | 25 | 100 | 0 | 125 | 60 | 0 | 40 | 7 | 5 |
| TBC | Genetics of Infectious Disease Pathogens | Elective | 1 | 30 | 95 | 0 | 125 | 0 | 100 | 0 | 7 | 5 |
| TBC | 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>

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<http://www.imperial.ac.uk/admin-services/secretariat/college-governance/charters-statutes-ordinances-and-regulations/>

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