MSc and Postgraduate Diploma in One Health (Infectious Diseases) Programme Specification

1. Awarding institution	The Royal Veterinary College
2. Teaching institution	The Royal Veterinary College (University of London)
3. Programme accredited by	
4. Final award	Master of Science and Postgraduate Diploma
5. Programme Title	One Health (Infectious Diseases)
6. Date of First Intake	*September 2013 (MSc)* *September 2014 (Postgraduate Diploma)*
7. Frequency of Intake	Annually in September
8. Duration and Mode(s) of Study	Full time (one academic year) or part-time (2 (Diploma) or 3 (MSc) academic years).
9. Timing of Examination Board meetings	Annually in July and September
10. Date of Last Periodic Review	*N/A*
11. Date of Next Periodic Review	*Not anticipated before 2018*
12. Entry Requirements	Entry to the course will be open to graduates with a University degree in a subject appropriate to the course of study, or a qualification in human or veterinary medicine, and a degree which is acceptable to University of London. The requirements for this course will be in line with those already in place for other MSc courses at the two institutions. Any applicant who does not meet the minimum entry requirements above but who has relevant professional experience may still be eligible for admission at the discretion of the Course Directors. The course demands an excellent understanding of both written and spoken English language, including scientific usage and comprehension. Applicants whose first language is not English will be required to provide evidence of proficiency. They will be required to achieve an overall score of 7.0 in IELTS with a minimum of 6.5 in each sub-test; or a TOEFL score of at least 93 (internet-based test with no element below 23). Any current discrepancy between the requirements of each college will be resolved by the higher standard procedure being applied. Entry of students with exemptions is possible provided that the RVC APL procedure is used.
13. UCAS code	N/A
14. JACS Code	N/A
15. Relevant QAA subject benchmark group(s)	N/A

17. Educational aims of programme

16. Reference points

N/A

Aim: To provide a comprehensive foundation in the principles of One Health as defined in the introduction and as they apply to infectious diseases.

The main objectives of the course are to demonstrate learning and understanding in the following areas:

- interpretation of the One Health concept and what it may mean in different contexts,
- One Health approach to complex disease issues using systems thinking, a trans-disciplinary approach and working from principles, apply concepts in order to address multi-faceted problems,
- disease ecology, evolution and emergence, the drivers of and impact of disease (social, economic, biological, demographic, ecological) and disease control or prevention options,
- the needed cognitive skills (such as planning, logic and reasoning, comprehension) and scientific skills, including critically reviewing scientific literature and design and analysis of laboratory and/or field studies ,
- key skills such as learning and teaching theory, communication and networking skills, information gathering, statistical numeracy, problem solving and integration of knowledge, ethics and values.

Term one

The introductory module* will ensure all students start on the assessed components of the course with the necessary generic skills and information that they will need. Early recognition during this module of any deficiencies in students' knowledge will enable course leaders and the students to take appropriate action. Module 1* then sets the scene of One Health and introduces students to the main concepts. Modules 2 and 3 will lead the students through current One Health disease issues using appropriate examples to illustrate principles of disease transmission, diagnosis and control (module 2) and similarly with emerging diseases (module 3). PBL sessions will encourage the generic One Health skills such as team working and communication. Running alongside modules 1, 2 and 3 is module 4 which will teach students the necessary epidemiological principles that can be applied to disease investigation and control. Module 4 case studies will use diseases/situations from modules 1, 2 and 3 to allow direct and relevant application of methods to situations. There will be different assessment methods for modules 2, 3 and 4 to reduce the impact of these 3 modules concluding in the same week. In addition, timelines for these assessments will be staggered.

Term two

Module 5 will provide the students with the skills to assess the economic impact of diseases and strategically placed tutorials will use of the diseases discussed in term 1 to illustrate the economic impact of disease. Specific teachings will focus on the economic impact of the control of diseases. Students will be encouraged to apply the concepts taught to diseases previously discussed. Module 6 will build on the learning in term 1 (modules 1-4) and will focus on One Health skills; systems thinking and managing disease complexity, communication and whole of society engagement impacting behavioural change, , and interdisciplinarity including ethics, environment and moral dilemmas, syndemics and promotion of resilience. Module 7 will expand on the epidemiological concepts taught in module 4 and evaluate them from an anthropological perspective. Additionally they will learn anthropological approaches and concepts and evaluate their role in One Health disease settings.

The Module Choices *8

1.1 will offer the opportunity to develop a more comprehensive understanding of epidemiology of vector borne diseases. Though practical entomological techniques students will develop and critically evaluate methodologies that can be applied to the control of vector borne diseases.

1.2 will emphasise the importance in the development paradigm of environment in health. Expanding on the impacts of landscape and climate change, urbanisation and industrialisation and how this creates exposure to pollutants, waste and other disease threats, concentrating on environmental epidemiological methods. Environmentally derived infectious disease will be covered for the One Health MSc students.

1.3 the module will provide more in depth material on epidemiology from a human perspective and enable One Health students to compare and contrast methodologies learned from veterinary epidemiological science.

1.4 Globalisation is a significant driver of modern health challenges and this module will focus on these in greater depth providing empirical evidence of the links between global change and health, and the methodological tools available to measure such links with case studies.

* Mandatory in Year 1 of part-time study.

18. Programme outcomes - the programme offers opportunities for students to achieve and demonstrate the following learning outcomes.

A. Knowledge and understanding of:

• The concept, principles, functions and processes of a One Health approach and use of transdisciplinary approach
• Fundamentals of disease, ecology, evolution and emergence, Vector Biology and Vector Interactions, resilience, syndemics, risk factors and disease drivers at the interface between people, animals and the environment
• Concepts of epidemiological investigations: One Health surveillance, monitoring and outbreak investigation and basic statistical methods used
• One Health Skills
• The use of economic methods in One Health
• Medical Anthropology

B. Cognitive skills:

• Reflection and self-evaluation
• Logic and reasoning
•Values and ethics
• Concentration and Perception
• Systems thinking
• Visual and auditory processing leading to long-term memory

C. Practical skills:

• Demonstrate scientific skills, including critical review of the scientific literature
• Use decision making skills and simple models to analyse One Health problems at local and national level
• Reflective writing
• Critical appraisal of technology that is available to do One Health
• Analyse qualitative and/or quantitative data on One Health interventions and report conclusions
•Systems approach

D. Key skills:

• Development of independent learning, taking responsibility for own studies. Reflectively evaluate and manage own learning and personal planning processes• Understanding own strengths and weaknesses and applying appropriate measures for successful learning in an isolated study situation
• Becoming a reflective self-manager, by taking a systematic, analytical, strategic and reflective approach to tasks
• Information gathering and analytical skills to make own judgements about ideas and knowledge
• Time management and organisational skills
• Communication and language skills
• Information technology skills

Teaching/learning methods

Teaching, learning and assessment activities are aligned to ensure the objectives of the course are clearly defined and that candidates have the opportunities to achieve these outcomes. Topics within each module help to establish the theoretical knowledge base and assessment activities are designed to enhance the learning process and help students to measure their own progress. All teaching, learning and assessment activities are designed to help candidates become actively involved in their learning and provide tools for them to identify and manage their learning to achieve the learning objectives to the best of their ability.

We recognise that each candidate's learning requirements are different and that they will change as they progress through the course. At the start of the course, candidates are given structured guidance and learning support in particular on reflective practice to enable them to become reflective practitioners. This will be achieved via problem based learning methods and discussion groups. The tutors will provide feedback and hints for improving performance and learning. Discussion and sharing of learning points with others on the course is encouraged to help each learner develop his or her own understanding of the content.

As candidates progress through the course, there will be increasing reliance on student-centred modes of learning, which will encourage and facilitate independent study both in the individual and team environments. This will help foster the development of a professional approach to lifelong learning.

Specific Teaching and Learning Activities for face to face delivery;

Each module will consist of a series of seminars/ lectures/ practicals. In each module teams of students will use single disease case studies but in the broadest context of multiple hosts and considering environmental factors and drivers in order to develop trans-disciplinary methodologies and a systems approach. This foundation will be built on in subsequent modules such that by the end of the course, students will understand the tools available from different specialist areas and how best to use integrative approaches to address disease issues in a variety of situations. To support the approach the following will be included:

1. All modules will have formative assessment – either mock open book exams (OBE) exams, reflective writing or other writing/presenting exercises
2. PBLs will be used throughout the course to facilitate inter-personal skills and team working in addition to deep and independent learning.
3. Tutor and Peer observation of presentations and critical appraisal by tutors and peers (using online resources) as well as critical appraisal of peers
4. Work-Based Directed tasks
5. Literature-based research
6. Self-directed and independent study

Teaching and learning theory will be incorporated throughout the course to provide insight into how these may impact the student experience and how these can be utilised in different situations.

Support and guidance:

Candidates will be guided by tutors providing both a pastoral and academic input. Pastoral and academic tutorials will occur twice a term in the first 2 terms. Additional tutorials may be arranged if needed in term 3.

Materials provided:

All study materials will be provided as:

- Student handbook
- Lecture notes as pdfs on RVC Learn
- Appropriate reading lists
- Relevant publications (copyright permitting)

Assessment
Assessment methods will be varied and will be designed to assess a range of skills including, but not limited to, trans-disciplinary working, team and individual work, integration of knowledge and deep learning skills. All assessment tasks will be aligned to the module learning outcomes and will monitor integrative and extended understanding of the subjects. Assessments may include presentations, essays, written and oral (verbal) examinations and approaches to practical scenarios.

Formative assessment activities are designed to enable candidates to assess their progress and help them identify and plan their further learning needs: dialogue between the student and their tutor/lecturers and peers together with discussion in the classroom, provides individualised feedback, to help reinforce good practice and importantly, help show where and how work can be improved.

Summative assessments are used at the end of each module. One Health principles will be assessed before the research project is started to ensure that candidates demonstrate the baseline competencies required from the range of knowledge, skills and attitudes necessary. The following assessment methods are used:

- Formative and summative OBE
- Presentations and reports
- Reflective and evaluative essays
- Academic writing
- Research methodology
- Problem solving exercises

19. Programme structures and requirements, levels, modules, credits and awards

Course structure
The MSc consists of eight modules of 15 credits each, plus a compulsory research project (60 credits -15 credits for integration of One Health principles learnt through development of and writing a Research proposal and 45 credits for the empirical or transdisciplinary innovative study). Credits awarded to this programme will be CATS credits (Credit Accumulation and Transfer System). The Diploma consists of the same modules (8 of 15 credits each) but there is no requirement to complete the Research Project.

The MSc consists of the following modules:
Foundation: Induction One Health Orientation (1 week) (not assessed or credit rated)

Eight credit rated (15) modules

Module 1 Foundations of One Health core module – (RVC with input from LSHTM): Introducing definitions, scope and a critical understanding of the trans-disciplinary nature of One Health as an approach to problem solving, examining contrasting approaches used to control human and domestic and wild animal health across sectors. The approach will provide you with the tools for working across health sectors on environmental change, such as climate change, and on human behaviour and globalisation impacts on future threats. Case studies are used throughout.

Module 2 Introduction to disease agents for One Health core module (RVC and 3125 IDAC LSHTM): Providing a knowledge of the life-cycles and characteristics of major infectious disease agents that have a strong environmental component and affect both animals and man, the principal intervention strategies used to combat these and analysis of factors contributing to the success or failure of systems of control and intervention, showing where a One Health approach is beneficial.

Module 3 Infectious Disease Emergence core module (RVC): Basic biology, epidemiology and pathogenesis of emerging diseases with particular attention to food safety, agro-ecology, biodiversity, genetics and innovation in control under the One Health paradigm. It includes the application of risk analysis from human, animal and environmental perspectives and an introduction to available tools.

Module 4 Introduction into One Health epidemiology core module (RVC): Providing detail on surveillance and outbreak investigation using an integrated approach in human, animal, environmental and ecosystem health. It includes basic statistics and modelling.

Module 5 Economics of One Health (RVC): The application of economics to One Health, showing (where sufficient data and modelling expertise are available), the application of economic tools and principles to One Health problems, including: the quantification of the economic effects of One Health; the use of economic methods to aid decisions at individual, local and national levels; the economic evaluation of specific One Health procedures and control programmes. No prior knowledge of economics is required.

Module 6 One Health Skills (RVC with input from LSHTM): Focusing on a systems approach to examine the ecology of disease from biomedical, socio-ecological, behavioural, epidemiological and management perspectives, and application of change theory, systems analysis, syndemics and an ecosystem approach, taking into account values, morals and ethics. It provides a route to integrating science and policy, using modern communication, informatics and analytical tools. It also provides a basis for scenario and contingency planning for unexpected events and consequences, research design appropriate to One Health problems, and use of interdisciplinary teams and social capital in disease control.

Module 7 Medical Anthropology 1802 (LSHTM): Providing an understanding of the social drivers of disease with a focus on medical anthropology and public health. It includes a demonstration of the analytical understanding of a range of concepts and principles and definitions used in medical and social anthropology. You will learn how to evaluate the role of anthropological enquiry in One Health and public health arenas and will use this perspective to critically evaluate epidemiological, medical, and veterinary and public health approaches.

Module 8 Choice (LSHTM): You will choose from between four LSHTM modules (each of which are worth 15 credits):

- Vector Biology and Vector-Parasite Interactions focuses on population and epidemiological study. It demonstrates knowledge of key aspects of vector behaviour, vector ecology and vector-parasite interactions and applies a range of practical entomological techniques and tools. This module is intended primarily for medical entomologists and parasitologists who wish to develop an active research interest in this discipline.
- Environmental Epidemiology covers key issues in environment and health, and methods for investigation of environmental health hazards, from climate change to water-related health risks, which includes a number of infectious diseases. Problems of measurement and estimations of exposure will be addressed and solutions discussed including use of GIS, time series and cluster analysis.
- Epidemiology and Control of Communicable Diseases covers aspects of the compulsory introduction to epidemiology module in more depth, providing an opportunity for exploring mathematical models of infection dynamics and sero-epidemiology. Outbreak investigation and surveillance will include a simulated outbreak which you will investigate, analyse and write-up. Vaccinology is covered in detail mostly from the human perspective.
- Globalisation and Health covers key issues in global health, including: definitions and conceptual frameworks, forms of global change related to health, and theoretical and methodological challenges of measuring links between global change and health. Major issues in global health such as trans-border health risks, global health inequalities, changing determinants of health and aspects of global health governance will be described and discussed.

Research project 60 credits (25% for development of the proposal and 75% for the research project) -Not required for the Diploma.

In the final five months you will work on an individual project under the guidance of a supervisor. The project consists of a research proposal and literature review and a study, which can be either empirical, strategic or policy oriented. You many undertake the research at the RVC, LSHTM or at an external institution with supervisors from either institution. Participants sponsored by their employer often carry out a project related to their work.

Marking scheme and classification criteria:
The MSc will be awarded with a grading of Distinction, Merit, Pass or candidates will be deemed to have failed (The Diploma will be awarded with a grading of Pass or Fail). The award is normally given on the basis of achieving marks within the appropriate range. Examiners have complete discretion to take into

account the student's overall performance.

Marking scheme for examinations:

Each component of assessment except MCQs will be marked out of 100 according to the Common Grading Scheme (http://intranet.rvc.ac.uk/StudentsAndTeaching/MarkingSchemes.cfm). For MCQs the number of marks available for each question will be clearly stated on the examination paper. A question left unanswered or deleted by the candidate will score zero. The total for each paper will be adjusted pro rata to a mark out of 100. Grades assigned for LSHTM module assessments will be converted using the conversion table in Annexe B of the Modular (Assessment and Award) Regulations for PGCert, PGDip and MSc.

Requirements to Pass Overall (Masters):

The total number of marks for the different assessments will be scaled and summated, and converted to a percentage. Candidates' marks will be moderated by the External Examiners. The overall result will normally be determined by the candidate's combined percentage mark over all parts of the Examination. Candidates will be expected to achieve an overall average mark of 50% to pass the examination. Compensation between components is permissible in determining the award of Distinction or Merit, which shall normally be based upon the candidate's overall percentage mark, irrespective of the marks obtained in individual components.

Requirements to Pass Overall (Diploma):

The total number of marks for the different assessments will be scaled and summated, and converted to a percentage. Candidates' marks will be moderated by the External Examiners. The overall result will normally be determined by the candidate's combined percentage mark over all parts of the Examination. Candidates will be expected to achieve an overall average mark of 50% to pass the examination.

Estimated study hours overall:
1,800 notional learning hours (180 UK credits at Masters level). 1,200 notional learning hours (120 UK credits at Diploma level).
The course may be taken either full-time over one academic year or part-time over 2 or 3 years (maximum 2 years for Diploma and maximum 3 years for Masters).
The format of the course will follow that of RVC MSc courses, where there are 8 modules in total (4 each in terms 1 and 2), each with credit equivalence of 15 credits, and a project worth 60 credits.
Each module of 15 credits is expected to take 150 notional study hours. This will include:
- lectures and Problem Based Learning sessions
- independent study using self-directed study materials and associated readings,
- developing assessed work,
- participating in discussions.

20. Work Placement Requirements (BVetMed and FdSc only)	N/A

ASSESSMENT

Also see Modular Assessment and Award Regulations Annex A