MODULE SPECIFICATION

Academic Year (student cohort covered by specification)	2022-23
Module Code	3166
Module Title	Vector Biology and Vector-Parasite Interactions
Module Organiser(s)	Professor Mark Rowland and Dr Matthew Rogers
Faculty	Infectious & Tropical Diseases
FHEQ Level	Level 7
Credit Value	**CATS:** 15 **ECTS:** 7.5
HECoS Code	100265:100345 (1:1)
Term of Delivery	Term 2
Mode of Delivery	For 2022-23 this module will be delivered by predominantly face-to-face teaching modes. Where specific teaching methods (lectures, seminars, discussion groups) are noted in this module specification these will be delivered by predominantly face-to-face sessions. There will be a combination of live and interactive activities (synchronous learning) as well as recorded or self-directed study (asynchronous learning), plus face-to-face laboratory classes.
Mode of Study	Full-time
Language of Study	English
Pre-Requisites	Some preliminary knowledge is assumed (e.g. contents of Parasitology & Entomology (3122) in Term 1).
Accreditation by Professional Statutory and Regulatory Body	None
Module Cap (Indicative number of students)	10-15 (numbers may be capped due to limitations in facilities or staffing)
Target Audience	This module is intended primarily for entomologists and parasitologists who wish to develop an active research interest in this discipline in field or laboratory, or apply it within the context of a control programme.

Module Description	This module will provide students with a broad understanding of the key aspects of insect vector behaviour, vector ecology and vector-parasite interactions relevant to the epidemiology and control of vector-borne diseases. By the end of this Study Module students should be able to: Demonstrate knowledge and understanding of key aspects of vector behaviour, vector ecology and vector-parasite interactions. Demonstrate an understanding of how these features impact on the epidemiology and control of vector-borne diseases. Apply a range of practical entomological techniques and tools used in research on vector competence and ecology. Demonstrate the ability to critically evaluate the relevant scientific literature. Demonstrate some of the skills required to design a research project related to vector biology or competence. This module is intended primarily for entomologists and parasitologists who wish to develop an active research interest in this discipline in field or laboratory, or apply it within the context of a control programme. Some basic knowledge is assumed (e.g. contents of Parasitology and Entomology in term 1). This module will be divided into three teaching blocks covering research areas in vector behaviour, vector ecology, and vector-parasite interactions.
Duration	5 weeks at 2.5 days per week
Timetabling slot	Slot D2
Last Revised (e.g. year changes approved)	July 2022

Programme(s) This module is linked to the following programme(s)	**Status**
MSc Medical Entomology for Disease Control	Compulsory
MSc Medical Parasitology	Recommended Option
MSc One Health: ecosystems, humans and animals	Recommended Option

Module Aim and Intended Learning Outcomes

Overall aim of the module
The overall module aim is to: • provide students with a broad understanding of the key aspects of insect vector behaviour, vector ecology and vector-parasite interactions relevant to the epidemiology and control of vector-borne diseases.

Module Intended Learning Outcomes
By the end of this module, students should be able to: 1. Demonstrate knowledge and understanding of key aspects of vector behaviour, vector ecology and vector-parasite interactions 2. Demonstrate an understanding of how these features impact on the epidemiology and control of vector-borne diseases 3. Apply a range of practical entomological techniques and tools used in research on vector competence and ecology 4. Demonstrate the ability to critically evaluate the relevant scientific literature 5. Demonstrate some of the skills required to design a research project related to vector biology or competence

Indicative Syllabus

Session Content
The module is expected to cover the following topics: • Vector nutrition; • Dispersal and learning; • Host seeking and host selection; • Blood-feeding behaviour; • Anthropophily and zoophily; • Endophily-exophily; • Sugar feeding behaviour • Chemical ecology; • Sexual (mating) behaviour and pheromones; • Chemical ecology; • Seasonality and diapause; • Circadian activity rhythms and the gonotrophic cycle; • Simple mathematical modelling of transmission of vector borne diseases;

Session Content
• Genetic and physiological determinants of vector competence and vector-parasite specificity; • Effects of parasites on vector behaviour, survival and parasite transmission; • Host-parasite interactions with reference to mosquitoes and Plasmodium, Lymphatic filariae and Wolbachia; sandflies and Leishmania; blackflies and Onchocerca; ticks and viral pathogens. • Vector sampling and collection of overwintering mosquitoes (larvae and adult) for practical sessions on genus and species identification.

Teaching and Learning

Notional Learning Hours

Type of Learning Time	Number of Hours	Expressed as Percentage (%)
Contact time	40	26.7
Directed self-study	30	20
Self-directed learning	40	26.7
Assessment, review and revision	40	26.7
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
Teaching will include online lectures by specialists in each field, many with associated on-campus laboratory practicals; small group work for developing research proposals on selected topics related to the module. If possible, visits will be made to research institutions such as Natural Resources Institute (NRI) or Pirbright Institute of Virology working on vector behaviour and ecology and host-parasite interactions and control.

Teaching and Learning Strategy
Field site visits to N Kent marshes to experience vector sampling and collection of overwintering mosquitoes (larvae and adult) for practical sessions on identification and for summer project insight. Practical sessions on insect dissection, physiology and behaviour pertinent to field research and studies on vector-parasite interactions.

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 may be used to measure students' progress. The grade for summative assessment(s) only will go towards the overall award GPA. The assessment for this module will be online. Short test of multiple-choice questions on the module (33%); Written presentation of a research proposal in the form suitable to submit to an appropriate grant funding agency such as MRC, Welcome Trust, BMGF, WHO or BBSRC (67%).

Summative Assessment

Assessment Type	**Assessment Length (i.e. Word Count, Length of presentation in minutes)**	**Weighting** (%)	**Intended Module Learning Outcomes Tested**
Coursework	Individual project proposal on a topic pertinent to the module. See breakdown in Module Assessment Guidance document for word counts for different sections of the project proposal.	67	3 – 5
Timed Test (scheduled in-module MCQ online test)	1 hour	33	1 & 2

Resitting assessment
Resits will accord with the LSHTM's Resits Policy For students who are required to re-sit, or granted a deferral or new attempt, the tasks will be a multiple-choice test (based on reserve questions) and to produce a new project proposal or essay on a different subject.

Resources

Indicative reading list
Expert lecturers provide their own reading list pertinent to the topic. Standard Entomology and Parasitology texts as recommended for the MSc courses.

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.