

Erasmus Mundus Joint Master Degree

“International Master of Science in Infectious Diseases and One Health” (IDOH+)

Student Agreement – Scholar

University years: 2023 - 2025

The Université de Tours, France, is the coordinating institution (hereafter referred to as "Consortium Coordinator") of the **Programme (as hereinafter defined)** offered by the following universities:

- Université de Tours (UT), France
- Universitat Autònoma de Barcelona (UAB), Spain
- Medizinische Hochschule Hannover (Hanover Medical School - MHH), Germany

(UT, UAB and MHH each individually being a ‘Full Partner’ and together being referred to as the “IDOH+ Consortium”)

and supported by a network of 49 associate partners or networks, as set out in Annex 3 (“Associate Partners”).

The UT and

Surname, First Name:	
Address:	
Nationality:	
Date (day/month/year) & place of birth:	
Passport/ID number	

hereafter referred to as “the Student”, agree to the following terms and conditions:

1. General Information

1.1. Programme

The IDOH+ Consortium offers a two-year (120 ECTS) Erasmus Mundus International Master of Science in Infectious Diseases and One Health (610556-EPP-1-2019-1-FR-EPPKA1-JMD-MOB - 2019 Erasmus+: Erasmus Mundus Joint Master Degrees) (the “Programme”), which is approved and managed by the Education, Audiovisual and Culture Executive Agency (EACEA) and funded by the European Commission under the Erasmus + programme.

1.2. Mobility scheme

The Student will follow the following mobility scheme:

- Year 1 – Semester 1 (30 ECTS): Université de Tours, France (UT)
- Year 1 – Semester 2 (30 ECTS): Universitat Autònoma de Barcelona, Spain (UAB)
- Summer School: UAB (on behalf of the Consortium): Attendance is mandatory.



- Year 2 – Semester 3 (30 ECTS): Medizinische Hochschule Hannover, Germany (MHH)
- Year 2 – Semester 4 (30 ECTS) Internship at either a Full Partner's or Associate Partner's premises (as hereinafter defined).
- Workshop (including Master thesis defense): UT

Some mandatory language courses will be given during the first semester (French language - 3 ECTS) and the second semester (Spanish language - 3 ECTS). For Students already fluent in French and/or Spanish, another language (such as German or Italian) courses could be offered instead, using e-learning methods.

1.3. Milestones of the academic calendar

1.3.1. First semester will start on September 4th 2023 with welcome days and will stop on December 22nd 2023 at the latest.

Examination periods of the first semester will be notified to the Student on his/her arrival at UT. Semester could be conducted partially or entirely at distance (remotely) depending sanitary situation and national regulations.

1.3.2 Second semester will start on January 8th 2024 and finish on June 30th 2024 at the latest. Examination periods of the second semester will be notified to the Student on his/her arrival at UAB.

1.3.3 Summer school will be on June 17 to 21st 2024 in Barcelona (dates to be confirmed by UAB). **Attendance is compulsory.**

1.3.4 Third semester will start on September 2nd 2024 and finish on December 20th 2024. Due dates for assessment items will be notified to the Student on his/her arrival at MHH.

1.3.5 In the fourth semester, the Student will undertake a 6-month internship/traineeship and write up a master thesis at a Full Partner or Associate Partner's premises (the "Internship").

The host institution for Internship and the subject of the thesis will have to be chosen **no later than June 1st 2024** as a deadline to allow enough time for approval and completion of any visa procedures, if necessary and applicable.

Internship/traineeship will start in January, 2025 and last 6 months.

The IDOH+ consortium will collect internship/traineeship proposals from all partners, then, after validation, will communicate them to the students.

Each student is in charge of applying to one or more proposals and the welcoming institution will do selection in a fair process.

Considering that the consortium will pay for bench fees or registration costs for the fourth semester for a maximum of 8 students per intake or a maximum of 25,200 € per intake, the choice for these 8 students will be worked on a "first come first served" basis.

Master thesis should be sent to the coordinator no later than July 15th, 2025.

1.3.6 Thesis defense will be organized in Tours at UT, at end of August, 2025 or at beginning of September, 2025.

1.4. Grading and credits

1.4.1 Each Full Partner allocates ECTS to courses successfully completed.



1.4.2 Used Examination methods are described in the curriculum description (see Annex 2). If the Student fails an overall course, there will be the possibility to re-sit assessment items. However, if the Student fails re-sit assessment again, he/she may be forced to withdraw from the Programme.

1.4.3 The IDOH+ Consortium will use each Full Partner and ECTS own local grading scales. Following comparative grading scale table shall be used when comparing grades between the Full Partners:

ECTS	Definition	FR	ES	DE
A	Excellent: outstanding performance with only minor errors	18-20	A+: 10 With Honours A: 9.0-10	1-1.5
B	Very Good: above the average standard, but with some errors	16-17.9	8.0-8.9	
C	Good: generally sound work with a number of notable errors	14-15.9	7.0-7.9	1.6-2.5
D	Satisfactory: fair but with significant shortcomings	12-13.9	6.0-6.9	2.6-3.5
E	Sufficient: performance meets the minimal criteria	10-11.9	5.0-5.9	3.6-4.0
F	Fail: considerable further work is required	0-9.9	0.0-4.9	4.1-5

1.5. Type of diploma

At the end/completion of the Programme, and provided that the Student meets the academic requirements, he/she will be awarded of a joint degree "International MSc of Infectious Diseases and One Health".

In addition, a Joint Degree Certificate will be delivered.

2. Student's Commitment

2.1 The Student declares that he/she meets the minimum academic requirements needed to join the Programme; specifically, a Bachelor's Degree (or equivalent degree of 180 ECTS) and proficiency in English equal to or higher than high level B2 (according to the Common European Framework of Reference for Languages, CEFR).

2.2 He/she hereby commits him/herself to duly take part in the Programme, to start studies at the beginning of the Programme, in accordance with all terms and conditions of the present agreement. He/she has the right to start any occupation with a regular salary, in the respect of local national laws. ***However, the IDOH+ consortium warns him/her about the heavy workload for the Master's degree and difficulties which could arise in cumulating additional occupations and this workload.***

2.3 He/she hereby commits him/herself to follow the rules and regulations established for using laboratories and other related facilities at the hosting institution (whether it be a Full Partner or Associate Partner): in particular, regarding safety instructions for the use of laboratory and animal facilities.

2.4 He/she notes that a thesis shall be submitted as a result of the Internship during Semester 4 and this shall be defended at a workshop in Late August-Early September 2025. This thesis should be submitted as a pdf document no later than 15th July 2025.



3. Obligations of the Student

The Student shall comply with the following requirements:

3.1. Attendance/Participation

3.1.1 The Student will duly attend the Programme (including lectures, modules, Summer school, workshops, examinations, and the Internship). Otherwise, he/she will have to justify non-attendance by providing a medical certificate for illness, or anticipate for not-attending permission with motivated reasons wither from the person in charge of the current module or the local coordinator.

The IDOH+ Consortium will consider course attendance as an integral part of the Programme.

Subject to justified interruptions under clause 3.3, absence from more than 25 % of the required classes will result in the exclusion of the Student from the Programme. Course attendance will also be checked/verified for possible students following online lectures before arriving in the concerned university. It's not possible to not come for a complete semester.

3.1.2 Participation of the student in evaluations/surveys conducted by the consortium and/or the European Commission/EACEA is mandatory. Any breach of this obligation may cause the exclusion of the Student from the Programme.

3.2. Behaviour

The Student will comply with the local national laws applicable and regulations in force in hosting institutions (whether that be a Full Partner or an Associate Partner). ***He/ she shall commit no fraudulent act, such as cheating, falsification or plagiarism, otherwise he/she will be excluded from the Programme.***

3.3 Interruption of the programme

In the case, the Student is forced to interrupt the Programme for a certain period of time on valid grounds (for example health, pregnancy, military duty), the Student must notify the local coordinator as soon as possible, who will relay and inform different other members of the consortium.

4. Rights of the Student

The Student will benefit from a master's programme and service offer in accordance to what has been announced in promotional documents by the IDOH+ Consortium.

He/she will notably have the following rights:

4.1. Equality

The Student is entitled to:

4.1.1 **be treated and be offered same services** by the IDOH+ Consortium as students of existing local programmes of the host institution regarding irrespective of gender, ethnic background, religion or other belief, sexual orientation, or disability;

4.1.2 appeal against any act he/she would consider as discriminatory. In this case, he/she may appeal to the Coordination Office of the IDOH+ Consortium.

4.2. Administrative and Academic Issues

The Student has the right to:

- be kept informed on the Programme in a transparent manner, and therefore, to be provided with all relevant information, particularly regarding admission requirements and criteria, prerequisites, course content, learning outcomes, and degree award;
- benefit from an appropriate counselling, both before and during the Programme;
- have a free access to adequate services and means of support in order to complete the Programme.

4.3. Student Participation and Involvement

4.3.1 Students taking part in the Programme will be represented by a student representative who shall be invited to take part in certain decision making and course evaluation committees.

Each Student shall have the opportunity to apply to be a Student Representative.

4.3.2 Students are encouraged to join the Erasmus Mundus Students and Alumni Association (EMA <http://www.em-a.eu/>)

4.4. Assistance

The Student will receive assistance from the International Relations Office of each host institution or, depending of the University organization, from local administrative managers or coordinators.

In each host institution visited, the Student will have a tutor assigned, who will act as a reference point during his/her stay, from whom the Student can seek advice should any academic, logistic or administrative difficulties arise.

4.5. Privacy and Data Protection

The Student has the right to privacy and protection of individual information.

Hereby signing, the Student consents to his/her personal data being processed by and provided to UT, and transferred by UT to and processed by UAB, MHH and any relevant Associate Partners (including Associate Partners based outside of the European Union) for the purposes of administering and delivering the Programme, monitoring and evaluating the Programme and providing feedback on student performance only; provided that UT shall, and shall ensure that any parties to whom such personal data is transferred shall, deal with all such personal data appropriately, in a secure and confidential way, in accordance with all applicable laws.

The student acknowledges having been informed that "The European Education and Culture Executive Agency (EACEA), in the context of managing the Erasmus Mundus Joint Master Degrees, collects and processes personal data of some of the candidates. In particular, certain data of scholarship holders



(students and scholars), non-scholarship holders and reserve list candidates is shared with the Agency through the [EACEA Mobility Tool](#) and treated according to the following [privacy statement](#).

4.6. Health Insurance

4.6.1 During all the duration of the Programme, a medical insurance coverage will be offered to the Student, at no extra cost. The insurance policy covers all the Minimum Requirements defined by the European Commission, including the following: Health Care, Assistance to Person, Accident, Civil Liability/Private Life. Moreover, it provides additional coverage regarding chemical and infectious risks. A dedicated Website is made available by the insurance company (Dr Walter, <https://www.dr-walter.com/en/index.html>) to the Student so that he/she can manage his/her coverage (information in English about general terms and conditions, claim forms, FAQ, etc.). Assistance service includes staff speaking the following languages: German, English, French and Spanish. The coverage starts 2 months maximum before the registered start date (4th September 2023) and ends 3 months maximum after the registered end of the programme (4th September 2025).

4.6.2 Moreover, the Student has access to medical services on the campuses of host institutions, as same way as students of other Programmes of the host institution.

5. Obligations of the Consortium

5.1 On IDOH+ Consortium's behalf, the Consortium Coordinator hereby commits itself to provide the Student with a Master's Programme of excellence and a high-level service offer, in accordance to what has been communicated in promotional documents, particularly regarding issues such as tuition, supervision, timetable, course content and evaluation. All relevant information about IDOH+ Programme structure and organization is available on the dedicated Website (<https://www.infectious-diseases-one-health.eu>) and in IDOH+ Student Guide.

5.2 The Consortium Coordinator – on the behalf of IDOH+ Consortium - is responsible for the payment of the scholarship, according to 7. Financial Provisions article point.

6. Rights of the Consortium

The Consortium Coordinator has the right to terminate this agreement and withdraw the student from the Programme if:

- The Student is found not to meet the requirements outlined in Section 2
- The Student is in breach of any of the obligations set out in Section 3

7. Financial Provisions

7.1. Participation costs

Participation costs are set to:

- **4500 € per year for Students from Programme Countries** (being Students who are citizens of the current member states of the European Union (EU) at the time of signing of this Agreement, as well as the former Yugoslav Republic of Macedonia (as described in the Programme guide but now called Republic of North Macedonia), Iceland, Norway, Liechtenstein, and Turkey) or Students who are citizens of other countries but whose nationality is one of the Partner countries, if they have been residents of or have carried out their main activity (studies, training or work etc) for more than a total of 12 months over the last five years in any Programme country.



- **9000 € per year for Students from Partner Countries** (Students who are citizens of any country other than the above-described Programme countries). The participation costs include the teaching costs, insurance costs, the participation fees to the welcome days, the summer school, the workshop (except the travel costs) and bench fees (if applicable) or UAB registration during the internship (if applicable).

Concerning beneficiaries from the United Kingdom, the Withdrawal Agreement foresees that the United Kingdom will continue to participate in the current 2014-2020 EU programmes. This means that beneficiaries from the United Kingdom can continue to take parts in grants awarded under the 2014-2020 programming period until their end date, even if it is after 2020. As a result, a mobility spent at an institution from the **United Kingdom will continue to be considered as a mobility period in a Programme country**.

Moreover, students from the United Kingdom who are enrolled will continue to be assimilated to Programme country students and/or residents.

7.2. Scholarship

7.2.1 Subject always to clause 7.2.7, the scholarship monthly allowance will be allocated to the Student in twenty-four (24) **monthly instalments of 1000 €**.

7.2.2 Additional support for mobility and installation costs if applicable, according to Erasmus + regulations, will also be paid to the Student, as set out below:

7.2.2.1 Concerning the contribution to mobility costs, the full amount for year 1 shall be paid upon arrival at UT and the full amount for year 2 upon beginning of the third semester.

The amount is:

- 1 000 EUR per year per scholarship holder resident in a Programme Country
- 2 000 EUR per year for travel costs for scholarship holder resident in a Partner Country whose location is situated at less than 4.000 km from the EMJMD coordinating HEI
- 3 000 EUR per year for travel costs for scholarship holder resident in a Partner Country whose location is situated at 4.000 km or more from the EMJMD coordinating HEI

7.2.2.2 The contribution to installation costs (1, 000 €/ intake) shall be paid in full upon arrival at the UT and shall only be payable to a Partner Country Student.

7.2.3 The contribution to participation costs will be deducted directly from the scholarship funds.

7.2.4 The scholarship is a full scholarship, meant to cover all costs (e.g., tuition fees, travelling, visa costs, accommodation, living expenses, etc.). There will be no further funding.

7.2.5 The scholarship will be paid by bank transfer to the account number mentioned in Annex 1. The Student shall inform the Consortium Coordinator of any change in his/her bank details. Scholarship payment to scholarship holder will be made in EURO.

Scholarship does not create nor involve any employer-employee link between the Consortium Coordinator and the Student; therefore, it is not subject to direct taxation.

7.2.6 A scholarship can be put on hold if the Student has to temporarily leave the Programme following to duly justified and well documented reasons.

Such cases relate to medical reasons and/or serious family reasons (e.g need to temporarily take care of a close family member or hospitalization/death of a family member).

In such a case, the scholarship payment must be interrupted until the Student is again physically present and can actively pursue the Programme activities.

7.2.7 As prescribed by the Erasmus + rules, scholarship funds payable to scholarship holders will be withdrawn where:

7.2.7.1 the scholarship holders spend any period during their participation in the Programme (whether that be for study, research, placement, thesis, preparation or any other reasons) in their country of residence; or

7.2.7.2 a scholarship holder from a Partner Country spends any period during his/her participation in the Programme exceeding three months (indicatively the equivalent of 15 ECTS credits) in any Partner Country.

7.2.7.3 this payment withdrawal will also depend on the EACEA recommendations for the eligibility of the student during the COVID19 pandemics.

7.2.8 The Student must not receive any other scholarship or subvention by the European Commission within the framework of other Community programmes.

7.2.9 In case of termination of the Student's participation in the Programme (for example withdrawal for personal reasons, exclusion from the Programme because of insufficient academic results or fraudulent act, etc.), the Student shall reimburse the amount received that exceeds his/her actual incurred expenditure. According to the number of months he/she attended and a copy of his/her return ticket, the Coordination Office of the IDOH+ Consortium will set the amount to be reimbursed.

8 - Intellectual Property Rights

Any results generated by a student in connection with the Programme shall be owned by the given student, unless otherwise agreed in writing.

A specific chapter in the Internship agreement should define precisely the Intellectual Property Ownerships for any results generated during the internship/work placement.

9. Termination and Resolution of claims

The IDOH+ Consortium (and for the avoidance of doubt, each Full Partner or Associate Partner) bears no responsibility for accidents, illnesses, injuries, losses or damages to persons or goods resulting from or related to the activities planned in the present agreement, provided this is not the result of serious and deliberate misconduct by it/them.

Any dispute arising between the parties shall be settled amicably; if no amicable settlement can be reached, the French courts are designated as the only competent authorities to resolve any legal dispute between the IDOH+ Consortium and the Student emerging from the agreement.

The present agreement will be governed by the French Law.

- Both parties declare they have read and accept the conditions hereby defined. Each party receives one copy of the signed agreement.
- The scholarship holder declares to not have already benefited from a previous EMJMD scholarship or an Erasmus Mundus Master Course/Joint Doctorate scholarship.
- The scholarship holder commits to not benefit from another EU funded scholarship scheme to follow the same EMJMD course for the entire period of the course.
- The financial support shall be repaid by the scholarship holder in case of fraud or false declaration."

the Student:	
Date and place of signature:	
Signature:	

the Consortium Coordinator:	
Date and place of signature:	
Signature:	



Annex 1: **Bank account details**

The student will be required to open a bank account in Euro device and will be responsible for communicating his/her Bank account details in a RIB/RICE format details.

This will include:

- Bank branch details (agency address/domiciliation)
- Account holder's name
- IBAN (International Bank Account Number)
- BIC (Bank Identifier Code) / SWIFT code



**Annex 2:
Curriculum description**

First Semester: UT			Hours	ECTS
Introductory course	Basic Immunology	Lectures Tutorials - Flipped classrooms	4h 16h	4
	Statistics	Lectures Independent work	15h 65h	
Infectious diseases & Public health	Major infectious diseases affecting humans, Emerging pathogens, "Omics", Pathogen-induced cancers, Introduction to One Health	Lectures Tutorials Independent work	60h 15h 90h	7
Immune response against infectious diseases at systemic and mucosal levels	Innate immune response, Dendritic cells, Neonate immunity, Mucosal barrier, Lymphoid tissues of mucosa, Passive immunity, Immunity against pathogens	Lectures Practical courses Independent work	40h 15h 70h	5
Host-pathogen interactions	Molecular and cellular mechanisms of host-pathogen interactions : Virus morphogenesis, Pathogen entry and trafficking in infected cells, cell-to-cell spreading, interference and viral restriction.	Lectures Tutorials Independent work	25h 6h 44h	3
Virulence and Resistance	Virulence genes, Regulation systems, Viral diversity and escape. Anti-infectious chemotherapy, Pathogen resistance and evolution, Mobile genetic elements	Lectures Tutorials Practicals Independent work	36h 10h 10h 69h	5
Animal Welfare, Animal Models and their alternatives	Animal Welfare Comparative anatomy (mice, fish, sheep, rabbit) Animal models for vectorized diseases Fish and zebrafish models : imaging Animal models for such as cancer, atopy, heart disease and neurodegeneration. Alternatives (explants, organoids, embryonated eggs, xenopus eggs, blood pockets for insect feedings, ex vivo experiments)	Lectures Tutorials Practicals Independent work	14h 5h 16h 40h	3
French language	Basic linguistic tools. Oral and written expression	Tutorials Independent work	48h 27h	3

Second semester: UAB			Hours	ECTS
One Health and Major & Endemic zoonosis	Epidemiology and risk analysis: Basic epidemiological concepts. Surveillance. Risk assessment. Geographic information systems. Major and endemic zoonoses: Multidisciplinary approach to major viral, bacterial, parasitic and fungal zoonosis. Diagnosis, control, risk assessment, management and communication.	Lectures Tutorials and Supervised work Practical work Independent work	58h 30h 18h 119h	9
One health in emergent diseases and in special situations	Emergent zoonosis. Zoonosis in immunosuppressed populations. Risk assessment, management and communication of zoonosis in situations of Public Health Alerts, Bio threats and in low/income countries.	Lectures Tutorials Practical work Independent work	58h 21h 13h 133h	9
One health in Food safety	Food Safety and Security under the One Health approach. Evolution of food borne zoonosis. Principal Food borne bacteria, parasites, viruses, prions, mycotoxins and biotoxins.	Lectures & seminars Tutorials Practices Independent work	33h 18h 22h 77h	6
Biosafety and biosecurity	Hazard Criteria and Categorisation of Microbes. BSL3 and BSL4 Lab Technical specifications. Risk assessment procedures and Biosecurity. Experimental procedures with animals under biocontainment.	Lectures Practices Independent work	20h 20h 35h	3
Spanish language	Basic linguistic tools	Lectures Independent work	50h 25h	3

Summer School : Soft skills (creative thinking, effective communication, assertive leadership)	Organized by UAB
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Third Semester: MHH			Hours	ECTS
Infectious Diseases and Diagnostics	Medical microbiology, medical virology, Infection of organs (gastrointestinal tract, respiratory and nervous systems). Monitoring infectious diseases following antiviral or anti-bacterial therapy. Bacterial protein toxins.	Lectures Seminars Practices Independent work	38h 28h 40h 104h	7
Translational Medicine & Innovative Therapies	Major classes of therapeutics Coding and noncoding RNA Monoclonal antibodies and innovative antibody formats, Vaccines, Combination therapies Preclinical testing- Regulatory framework for clinical trial application in the EU Phase I clinical trials and translational medicine	Lectures Seminars Practices Independent work	28h 28h 14h 80h	5
Genomes and Gene Editing	Gene transfer, Gene expression, Gene Therapy, Genome editing, Bioinformatics	Lectures Seminars Independent work	32h 32h 86h	5
Emerging Viral Infections: Discovery and Intervention Strategies	Virus discovery: NGS, sequence analysis, phylogeny. Molecular toolbox: Reverse genetics Host restriction/adaptation: receptor usage and replication. Viral pathogenesis Development of prophylactic and therapeutic intervention strategies	Lectures Tutorials Practices Independent work	46h 8h 16h 80	5
Biorisk Management in Research and Diagnosis	Comprehensive biorisk management approach New concept of WHO on the relationship between risk groups of organisms and containment requirements	Lectures Seminars Practices Independent work	28h 28h 14h 80	5
Scientific Reading, Writing and Presentation	Searching the scientific literature; scientific writing style; writing graduate level papers, proposals, projects, and thesis components; preparing scientific presentations; presentation of data.	Lectures Seminars Independent work	21h 35h 34h	3

Four Semester: Internship/Master Thesis		ECTS
Written report (50 %)		15
Oral presentation (20 %)		6
Answers to jury question (20%)		6
Supervisor Evaluation (10 %)		3

Introductory Course - Immunology Part

Organization: Université de Tours

Teaching unit coordinator: Isabelle DIMIER-POISSON

Position: Professor (PhD)

Teaching unit outline

This module will be focused on immunology to ensure that all the students share the same basic knowledge in this core discipline of the programme. A teaching approach close to the “flipped classrooms” concept will be implemented for this introductory course to develop the student's ability to acquire new knowledge autonomously but also to meet and to work collectively, for instance to deepen a meaningful concept through interactive group activities.

Topics addressed

Immunology:

Lymphoid tissues

General introduction to the immune system

Structure and organisation of the immune system

Complement

Immunoglobulins and B lymphocytes: Structure and function of immunoglobulins, Molecular genetics, antigen-antibody interactions, lymphocyte development, B lymphocyte biology, signaling mechanisms and activation

T lymphocytes: T cell antigen receptors, T lymphocyte signaling mechanisms and activation, development of T cells, peripheral T lymphocyte responses and function

Macrophages and phagocytosis

Major Histocompatibility complex (MHC) molecules: Structure, Function and genetics

Cell biology of antigen processing and presentation

ECTS	Lectures	Tutorials	Practical work	Digital learning	Personal work
2	4	16 hours			30

Assessment method

Oral presentation 100%

Introductory Course - Statistics part

Organization: Université de Tours

Teaching unit coordinator: Clovis TAUBER- Bruno GIRAUDEAU

Position: Assistant Professor (PhD). Professor (MD; PhD)

Teaching unit outline

This module will be students the basis of Statistics and train them for the use of R software.

Topics addressed

Statistics: Probability, Bayes rule, correlation versus causation, Mean, Median, Mode; Standard Deviation, Variance, Normal distribution, linear regression, Confidence intervals, Statistical tests

ECTS	Lectures	Tutorials	Practical work	Digital learning	Personal work
2	15				35

Assessment method

Computer based exam 100%

Public Health and Infectious diseases

Organization: Université de Tours

Teaching unit coordinators (Part 1): Laurent MEREGHETTI - Daniel MARC

Position: Professor (M.D-PhD) - INRAE Researcher (DVM-PhD)

Teaching unit coordinators (Part 2): Romuald PATIENT - Antoine TOUZE

Position: Assistant Professor (PhD) - Professor (PhD)

Teaching unit outline

This module will present the general concepts in infectiology and public health, and in epidemiology. Lectures and tutorials will give the student an understanding of the epidemiological tools currently used, including new tools of phylogenetics and molecular epidemiology. The module will introduce the One-Health concept. It will also give an overview of the impact of major infectious diseases affecting humans and animals as well as some recently emerged diseases. The role of pathogens in cancer induction will also be discussed (part 2)

Topics addressed

General concepts

- . General methods in infectiology
- . Basic concepts in epidemiology
- . Big data and management of infections
- . European networks (VetBioNet, EU-JAMRAI, One Health EJP)
- . New tools of phylogenetics and molecular epidemiology
- . Healthcare acquired infections
- . Surveillance and emergency
- . Viral contamination of the environment
- . Emerging infections in animals

Specific infectious diseases

- . Bacteria: Tuberculosis, Buruli ulcer, Legionellosis
- . Viruses : Influenza, HIV, Measles
- . Parasites : Malaria
- . Pathogen-induced cancers (papillomavirus and polyomavirus, Helicobacter pylori, Herpesviridae, HCV, HBV, retroviruses)

One Health concept

- . Introduction to the One Health concept
- . World Health Organization (WHO)
- . International organization in Animal health and welfare (OIE)
- . International organizations in food safety (FAO)

ECTS	Lectures	Tutorials	Practical work	Digital learning	Personal work
7	60h	20h			95h

Assessment method

Written exams (68.75%)

Oral presentation (workgroup about One Health topic) (25%)

Review of a scientific paper (6.25%)

Host-Pathogen Interactions

Organization: University of TOURS

Teaching unit coordinator: Emmanuelle BLANCHARD, Julie AUFAUVE, Agnès WIEDEMANN

Position: Professor of Cell Biology at the Faculty of Medicine (PhD), INRAE Researchers (PhD)

Teaching unit outline

This teaching unit includes 20h of courses with about ten different speakers from the fields of bacteriology, virology and parasitology. Speakers will also include faculty members from other universities. These courses explore the fundamental aspects of host-pathogen interactions at the molecular level by focusing on the mechanism by which a given pathogen hijack, modify and/or disrupt host cell functions to its benefit. Methods and research approaches based on specific examples will also be studied (e.g. *in vitro* infection/entry models, cell imaging, protein-protein interactions, tools to inhibit expression or function of proteins).

Topics addressed

- . Introduction to the cellular architecture, cytoskeleton and organelles.
- . Methods for imaging the interplay between cells and pathogens (*different methods of microscopy with applications, protein-protein interactions such as co-immunoprecipitation, affinity chromatography, yeast two-hybrid method...*).

- . Bacterial adhesion & virulence (*E coli*);
- . Mechanism of cellular invasion by bacteria & secretion systems (*Salmonella, Yersinia, Listeria, Shigella*), intracellular growth and multiplication of bacteria;
- . Bacteria and bacteriophages.

- . Virus entry into host cells and tropism;
- . Intracellular transport of viruses on cytoskeleton;
- . Morphogenesis of enveloped viruses;
- . Lipids and viral multiplication (Flipped classroom);
- . Virus cell-to-cell spread.
Various examples of viruses will be described to illustrate the host-virus interaction models such as HIV, Coronavirus, Hepatitis B Virus, Hepatitis C virus, Herpesvirus, Influenzavirus, Rabies lyssavirus.

- . Invasion strategies of intracellular parasites.
Several parasites of medical importance such as Toxoplasma gondii and Plasmodium falciparum and others of veterinary importance such as Eimeria tenella will be studied in this course.

ECTS	Lectures	Tutorials	Practical work	Digital learning	Personal work
3	25 hours	6 hours			44 hours

Assessment method

- 50% oral presentation (scientific article)
- 37.5% written examination
- Review of a scientific paper (12.5%)

Immune response against infectious diseases at systemic and mucosal levels

Organization: Université de Tours

Teaching unit coordinator: Isabelle DIMIER-POISSON (PhD)

Position: Professor -

Teaching unit coordinator 2: Sonia LAMANDE (PhD) - Fabrice LAURENT (PhD)

Position: INRAE Researchers

Teaching unit outline

In this module, the fundamental aspects of the innate and adaptive immunity will be taught. These two topics are central to understanding the host's interaction with an environment containing a wide range of potentially pathogenic microorganisms. The major role played by the dendritic cells at the interface of the innate and adaptative immune responses will be a major focus of interest. Practical works will complement this teaching by examining the immune response (Cell sorting, imaging, FACS analyses)

Topics addressed

Innate response: Toll like receptors, Natural Killer cells, Macrophages, Mucosal barrier

Adaptative response: Dendritics cells (presentation, subsets, functions), Mucosal lymphoïd tissues,

Antiviral immunity, anti-parasitic immunity, antibacterial immunity,

Microbiome

Practicals : Cell sorting, imaging, FACS analyses

ECTS	Lectures	Tutorials	Practical work	Digital learning	Personal work
5	40h		15 h		70h

Assessment method

29% Oral presentation of a scientific article

43% Written exam

14% Scientific report on the practical courses

Review of a scientific paper (14%)

Virulence and Resistance

Organization: University of Tours

Teaching unit coordinator: Catherine GAUDY-GRAFFIN

Position: Professor of Microbiology at the Faculty of Medicine (MD, PhD)

Teaching unit outline

After an initial short presentation to introduce the whole module, lectures will highlight different mechanisms of virulence associated with disease pathogenesis for a selection of important pathogens in humans and/or animals. Subsequent lectures and tutorials will give students an understanding of the mechanisms of drug resistance occurring with various viruses, bacteria and fungi. Treatment options for some major pathogens in humans and animals will be discussed.

Topics addressed

Virulence:

Diversity of the mechanisms of bacterial virulence
Mechanisms of plant colonization by zoonotic bacterial pathogens
HCV and HIV diversity and escape
Role of accessory proteins of HIV in the viral pathogenesis
Virulence of apicomplexan parasites
Pathogenic fungi
Malaria infection
Non conventional pathogens
Parasitic wasp virulence

Resistance:

Principles of antiviral therapy and molecular basis of viral resistance (models of HIV, HBV, HCV), illustration by interactive work using bioinformatic tools
Mechanisms of bacterial resistance (including practical work)
Fighting antimicrobial resistance (AMR), development of innovative products
Nematode resistance
Antifungal drugs and resistance mechanisms

ECTS	Lectures	Tutorials	Practical work	Digital learning	Personal work
5	36 hours	10 hours	10 hours		69 hours

Assessment method

40% Oral presentation of a scientific article
60% Written exam

Animal welfare, animal models and their alternatives

Organization: Université de Tours (UT), INRAE

Teaching unit coordinator: Stéphanie GERMON

Position: Assistant Professor (PharmD, PhD)

Teaching unit outline

This module will focus on animal models and their use in infectious or non-infectious diseases with a strong emphasis on animal welfare and the ethical issues. Moreover, students will learn about bioengineering and *in vitro* models for limiting the use of live animals in compliance with the 3Rs (Reduce, Replace, Refine) principles.

Topics addressed:

Animal Welfare

Comparative anatomy (mice, fish, sheep, rabbit)

Animal models for vectorized diseases

Fish and zebrafish models: imaging

Animal models for such as cancer, atopy, heart disease and neurodegeneration.

Alternatives (explants, organoids, embryonated eggs, xenopus eggs, blood pockets for insect feedings, ex vivo experiments)

ECTS	Lectures	Tutorials	Practical work	Digital learning	Personal work
3	14 hours	5 hours	16 hours		40 hours

Assessment method (to be confirmed)

Laboratory notebook - reports (50%)

Written exam (50%)

French language

Organization: Université de Tours (UT)

Teaching unit coordinator: Christian GAUJAC,

Position: CUEFEE director (CUEFEE: University Centre of French as a Foreign Language)

Teaching unit outline

This module will be an introductory course of French language. The aim of this course is to provide to the students the basic linguistic tools to understand and communicate efficiently from the very first day of class. Through this module, students will also learn the main aspects of French culture, geography and history.

Topics addressed:

Oral expression in French Language

Written expression in French Language

ECTS	Lectures	Tutorials	Practical work	Digital learning	Personal work
3	48 hours				27 hours

Assessment method

Oral expression (50%)

Written expression (50%)

One Health and Major & Endemic zoonosis

Organization: Universitat Autònoma de Barcelona

Teaching unit coordinator: Marga MARTIN

Position: Professor

Teaching unit outline

This module will start with a brief introduction to the most common epidemiological and risk assessment concepts and tools. Then, the general concepts of zoonosis and the evolutionary mechanisms of infectious agents for persisting despite the attack of the immune system and the current and future therapeutic agents or strategies will be introduced. The relevance and the final impact in the public health of these pathogens' escape and resistance mechanisms will be also evaluated. The biological, epidemiological, pathogenic, diagnose and control mechanisms of the most relevant zoonoses in the world will be presented from One Health concept perspective.

Topics addressed

Epidemiology: Basic epidemiological concepts, surveillance, risk assessment and geographic information systems.

Introduction to zoonoses and etiological agents: history of zoonoses; definitions, pathogens' mechanisms to avoid immune system.

Antimicrobial Resistance: multi-resistant zoonotic bacteria; use of antibiotics in animal production and MDR; consume and self-medication in human medicine and MDR; impact of multi-resistance in nosocomial infection; resistance against antiparasitic and antifungal products; new treatments and therapeutical approaches; the role of wild animals as reservoirs.

Major Bacterial Zoonoses: mycobacterias' molecular epidemiology; tuberculosis in humans and animals, new vaccine strategies and sanitation campaigns, control and communication; human and animal health actions against brucellosis; rickettsiosis; Lyme disease and other borrelias; Q fever; zoonoses of companion animals; tularaemia.

Major Viral Zoonoses: evaluation, control and communication of rabies; influenza A and the role of domestic and wild animals, the surveillance programme, antiviral resistances and new treatments; Coronavirus, MERSCo, SARS; research and communication skills in human outbreaks.

Major Parasitic and mycotic Zoonoses: Toxoplasmosis (control in cats, wild reservoirs, in pregnant women; leishmaniasis (in dog, in humans, new vaccines,); hydatidosis/ *Echinococcus multilocularis*; other parasitic zoonoses from companion animals; mycotic zoonoses in domestic animals.

Lab practices (Workshops): microbiological, immunological and molecular diagnostic tools and interpretation.

ECTS	Lectures and seminars	Tutorials and supervised work	Practical work	Digital learning	Personal work
9	58 hours	30h	18 hours		119 hours

Assessment method

Attendance and active participation in class	10 %
Attendance and active participation in the laboratory practices	20 %
Self-learning activities, deliverables and work oral expositions	30 %
Evaluation tests of theoretical and practical content or synthesis activities	40 %

One health in emergent diseases and in special situations

Organization: Universitat Autònoma de Barcelona

Teaching unit coordinator: Laila DARWICH

Position: Professor

Teaching unit outline

The biology, epidemiology, pathology, diagnosis and control mechanisms of the exotic and emergent diseases and the zoonoses in special situations will be presented under the OH approach in monographic sessions and round tables or debates. These special situations comprise: HIV immunosuppressed populations, emergency sanitation and health system management in low-income countries. A One Health vision of the topics will be implemented and the particularities of tropical and subtropical ecosystems will be studied with special emphasis in the endemic zoonotic microorganisms' lifecycles and the importance of vectors and the globalization effect on OH (international human transits and animal-plant free trade).

Topics addressed

Emergent and re-emergent pathogens: Introduction and risk assessment in exotic and emergent zoonoses (effect of climatic change in vectors and diseases; arbovirosis ; entomology; surveillance systems and vector control; other viral zoonoses: ebola outbreaks ; hepatitis E ; *C difficile*, and tropical parasites (epidemiology, clinics, diagnose and treatment of malaria; helminths; neurocysticercosis; trypanosomiasis)

Veterinary Border control: role and mission of veterinary border inspection posts (BIPs)

Management of zoonoses in situations of public health alerts, threats or emergency sanitation: management of epidemics and public health crisis; risk communication in emergencies; risk assessment and contingency protocols.

Zoonoses in HIV and immunodepressed population: VIH situation updates; role of pets and companion animals as a zoonotical risk; New therapies in immunosuppressed patients.

Control and management of zoonoses in low-income countries: public health, risk evaluation and communication in developing countries

Lab practices : entomology identification; parasitology

External visits: the Clinical Lab of Vall d'Hebron Hospital in Barcelona

Workshop : Humanitarian Emergency response (NGOs)

ECTS	Lectures and seminars	Tutorials and supervised work	Practical work	Digital learning	Personal work
9	58 hours	21h	13 hours		133 hours

Assessment method

Attendance and active participation in class	10 %
Attendance and active participation in the laboratory practices	20 %
Self-learning activities, deliverables and work oral expositions	40 %
Evaluation test of theoretical and practical content	30 %

One health in food safety and security

Organization: Universitat Autònoma de Barcelona

Teaching unit coordinator: Artur Xavier ROIG

Position: Professor

Teaching unit outline

In this module, the fundamental elements of food safety and security will be taught under the One Health approach through theoretical and practical sessions or by solving case studies. The main zoonoses transmitted by food, the factors associated with their presentation and their consequences for human health will be studied. Reservoirs, the most likely forms of contamination and their impact on different types of food will also be presented. The main policies related to food security will be discussed from a national, European and global perspective. Finally, the procedures for risk assessment and the detection of pathogens usually carried out by public health agents and the food industry will be taught.

Topics addressed

Evolution of management and communication policies in food safety and security: principles and proceedings for risk assessment in food safety; management and communication of risk in food safety; the concept of “Food defense” in food borne zoonoses.

Evolution of food borne zoonoses in Spain, Europe and Worldwide: effect of globalisation in food borne zoonoses; control tools in primary production; on-line information tools about food-borne outbreaks.

Food borne bacterial zoonoses: *Salmonella* spp., *Campylobacter* spp., *Yersinia enterocolitica*, *Listeria monocytogenes*, *Escherichia coli* VT, *S.aureus* and other coagulase-positive *Staphylococcus*; *Clostridium botulinum*, *C. perfringens* and *Bacillus cereus*.

Food borne parasitic zoonoses: protozoa; trematodes and cestodes; anisakiasis, trichinellosis and other zoonoses caused by nematodes.

Other food borne agents: viruses, like hepatitis A and E viruses, calicivirus and noroviruses; prions; mycotoxicosis and biotoxines.

Practical sessions: tertiary predictive models for process validation and risk assessment; data assessment from “challenge tests”

Laboratory practical sessions: protocols for the evaluation of the presence of pathogenic microorganisms in foods; use of microbiological biomarkers.

Workshop : nutritional crisis response (NGOs)

ECTS	Lectures and seminars	Tutorials	Practical work	Digital learning	Personal work
6	33 hours	18h	22 h		77 hours

Assessment method

Attendance and active participation in class	10 %
Attendance and active participation in the laboratory practices	20 %
Self-learning activities, and deliverables	40 %
Evaluation test of theoretical and practical content	30 %

Biosafety and biosecurity

Organization: Universitat Autònoma de Barcelona

Teaching unit coordinator: Natàlia MAJÓ

Position: Associate Professor

Teaching unit outline

In this module, students will be introduced to the concept of biosafety and biosecurity and will know the hazard criteria and the categorisation of most important disease agents. The risk assessment and the management and handling of human people and animals under biocontainment will be discussed. The characteristics and specifications of different biosafety laboratory levels will be presented. Students will be trained to work in the highest levels of biosafety laboratories and animal housing facilities (BSL3 and BSL4).

Topics addressed

Hazard Criteria and Categorisation of Microbes

BSL3 and BSL4 Lab Technical specifications

Risk assessment procedures and Biosecurity

Experimental procedures with animals under biocontainment

Practices: how to move in and out of BSL3 lab, handling of virus, cell cultures and spore forming bacteria in BSL3, handling positive pressure masks.

ECTS	Lectures	Tutorials	Practical work	Digital learning	Personal work
3	20 hours		20 hours		35 hours

Assessment method

50% Lab performance.

50% Risk assessment report.

Spanish Language

Organization: Universitat Autònoma de Barcelona

Teaching unit coordinator: Sònia PRAT

Position: Director of UAB Language Service

Teaching unit outline

This module will be an introductory course of Spanish language. The aim of this course is to provide to the students the basic linguistic tools to understand and communicate efficiently from the very first day of class. Through this module, students will also learn the main aspects of Spanish and/or Catalan culture, geography and history.

Topics addressed

Spanish Language

ECTS	Lectures	Tutorials	Practical work	Digital learning	Personal work
3	50 hours				25 hours

Assessment method

50% Oral expression.

50% Written expression.

Infectious Diseases and Diagnostics

Organization: Hannover Medical School

Teaching unit coordinator: Abel VIEJO-Borbolla, Guntram GRASSL

Position: Professor, Institute of Virology / Institute of Med. Microbiology

Teaching unit outline

This module will focus on pathogenesis, toxin biology, clinical aspects and diagnostic methods of bacteria and viruses. A series of lectures combined with practical work and tutorials will provide both theoretical and practical knowledge on relevant aspects of these topics. The students will also improve other skills including teamwork, preparation of written reports, presentation and discussion of scientific reports

Topics

Medical microbiology, medical virology with a focus on diagnostic methods and pathogenesis. Infection of organs including those within the gastrointestinal tract, respiratory and nervous systems. Monitoring infectious diseases following antiviral or anti-bacterial therapy. Bacterial protein toxins.

Key tools

Lectures on: Medical virology, bacteriology and immunology, bacterial protein toxins, human pathogenic viruses and bacteria, disease manifestations, diagnostic methods, therapy, antivirals and antibiotics.

Independent work:

POL (problem-oriented learning) Cases: Clinical case presentation and discussion with tutor. Journal Club: Medical virology, bacteriology and toxicology papers.

Practical work: ELISA for anti-HBs antibodies, immunofluorescence, neutralisation, virus titration, culture of bacteria, identification of bacterial species, antibiotic susceptibility testing, toxin detection, diagnostic PCR, etc.

ECTS	Lectures	Seminars	Practical work	Digital learning	Personal work
7	38 hours	28	40 hours		104 hours

Assessment method:

100 % Written exam

Ungraded course work:

Oral presentation (scientific paper)

Practical work (including written report)

Short lab project (including oral presentation)

Translational Medicine & Innovative therapies

Organization: Hannover Medical School

Teaching unit coordinator: Ulrich KALINKE

Position: Professor, TWINCORE Centre for Experimental and Clinical Infection Research

Teaching unit outline

The focus of this module is the transfer of knowledge in translational medicine in infectious disease and early phase clinical research with specific focus on vaccine development.

This module will address the classification of the three major classes of medicines, small molecules, biologicals, and medicinal devices. State of the art preclinical test systems will be introduced, including animal experimentation, with a focus on systems that are particularly suited to predict effects in humans. Key principles to be considered to prepare for application of clinical trial authorization at the competent authorities will be discussed. Finally, relevant infrastructure and measures necessary in order to carry out first-in-human clinical trials will be addressed.

Topics

- The three major classes of therapeutics: natural compounds, biologicals, devices
- Coding and noncoding RNA
- Monoclonal antibodies and innovative antibody formats
- Vaccines
- Combination therapies
- Preclinical testing: Animal experiments vs. assays based on primary human cells
- Regulatory framework for clinical trial application in the EU
- Phase I clinical trials and translational medicine

Students will gain knowledge about all relevant steps towards clinical development of innovative therapies after a new therapeutic strategy has been envisioned.

After successfully completing the module the students are able to understand how a new medicine is clinically developed in a phase I trial, to discuss the specific characteristics of vaccine development, to understand novel approaches in drug development (e.g. telomerase modulation) understand the importance of animal phenotyping during drug development, get an overview about bioinformatics tools in drug development, perform key experiments in RNA biology (detection, quantification of RNA molecules).

ECTS	Lectures	Seminars	Practical work	Digital learning	Personal work
5	28 hours	28 hours	14 hours		80 hours

Assessment method:

100 % Written exam

Ungraded course work:

Oral presentation (scientific paper)
practical work (including written report)
short lab project (including oral presentation)

Genomes and Gene Editing

Organization: Hannover Medical School

Teaching unit coordinator: Axel SCHAMBACH

Position: Professor, Institute of Experimental Hematology

Teaching unit outline

This module will focus on current state-of-the-art technologies employed in basic research and used to develop gene and cell therapy applications. The different scientific methods to transfer genetic information into target cells will be explained. This will provide students with the necessary background for teaching the various gene therapy strategies that have been tested pre-clinically and clinically, including control of gene expression and available approaches for targeted genome editing.

Topics

Gene Transfer: Overview of the appropriate use of non-viral and viral gene transfer methods, including discussion of the strengths and weaknesses of each approach. Systems commonly used in pre-clinical and clinical studies will be presented, such as electroporation, Sleeping Beauty transposon, adeno-associated virus (AAV) and retroviruses (lentiviral, alpha- and gammaretroviral systems).

Gene Expression: Genetic and pharmacological mechanisms to control gene expression will be presented, including antisense oligonucleotides, inhibitory RNAs (e.g. short-hairpin RNA) and microRNA.

Gene Therapy: Students will learn the history of gene therapy and the principal concepts behind gene therapy applications. We will cover the early gene therapy failures and the important lessons learned from these studies, which led to modified strategies based upon improved understanding of genetic components and how this knowledge led to successful translation for the treatment of human diseases like genetic disorders and cancer.

Genome Editing: Students will be introduced to genome editing technologies, including transcription activator-like effector nucleases (TALENs), zinc-finger nucleases (ZFNs) and clustered regularly interspaced short palindromic repeats (CRISPR)-associated nuclease Cas9.

Bioinformatics: Students will get an overview of bioinformatics resources for analysis of protein sequences. They will be introduced to immunomic and infectivity databases and learn how to deal with immunogenicity analysis.

ECTS	Lectures	Seminars	Practical work	Digital learning	Personal work
5	32 hours	32 hours			86 hours

Assessment method

50 % Oral presentation

50 % Review of a research paper.

Emerging Viral Infections: Discovery and Intervention Strategies

Organization: Hannover Medical School

Teaching unit coordinator: Teaching unit coordinator: Albert OSTERHAUS, Guus RIMMELZWAAN

Position: Professor, Research Center for Emerging Infections and Zoonoses (RIZ)

Teaching unit outline

This module will address fundamental aspects of viral zoonotic pathogens, such as discovery of novel viruses and assessment of their zoonotic potential, genetic analysis and phylogeny, host restriction factors and virus adaptation to novel host species, pathogenesis, intervention strategies and the use of a molecular toolbox to investigate viral determinants of virulence and transmissibility. Some important well characterized viral pathogens will be discussed in depth to illuminate different prophylactic and therapeutic intervention strategies.

Topics addressed

(i) Virus discovery: NGS, sequence analysis, phylogeny

Molecular toolbox: Reverse genetics to produce molecular clones of –ve and +ve RNA viruses, generation and use of pseudotyped viruses

(iii) Host restriction/adaptation: receptor usage and replication

Viral pathogenesis: virus tropism, tissue damage caused by virus replication and host response

Development of prophylactic intervention strategies

Development of therapeutic intervention strategies

This module will involve lectures, tutorials, self-study and both the writing of a mini review on a known specific zoonotic virus and presentation of this review as a team effort. In addition, the students will have the opportunity to partake in a two-day practical course on virus discovery.

ECTS	Lectures	Tutorials	Practical work	Digital learning	Personal work
5	46 hours	8 hours	16 hours		80 hours

Assessment method:

100 % Written exam

Ungraded course work:

Oral presentation

Review of a research paper

Biorisk Management in Research and Diagnosis

Organization: Hannover Medical School

Teaching unit coordinator: Juergen MERTSCHING

Position: Dr., Head of Biosafety Department

Teaching unit outline

This module will extend the basics of biosafety, biosecurity and biocontainment into a comprehensive biorisk management approach. The students will be introduced to the new concept of WHO on the relationship between risk groups of organisms and containment requirements. A further topic will be the handling of ethical issues, e.g. the estimation of “Dual-use-research-of-concern - DURC”.

After successfully completing the module, the students will acquire knowledge on the 16 components of a comprehensive biorisk management programme and will be able to understand how these multiple components can be integrated into a Plan-Do-Check-Act-cycle driven management system in place.

Topics addressed

After successfully completing the module, the students will acquire knowledge on the 16 components of a comprehensive biorisk management programme and will be able to understand how these multiple components can be integrated into a Plan-Do-Check-Act-cycle driven management system in place.

The students will be trained to use different tools for risk assessment in biosafety and biosecurity in order to understand and implement safety measures to reduce the risk of spreading infectious agents during lab work. In the Journal Club, they will master theoretical basics and discuss case studies of laboratory acquired infections.

Finally, students will attend the state approved course “Genetic engineering, Biosafety and Biosecurity” and will understand the legal regulations on the handling of genetically modified organisms in Germany.

Practices: Working with a mobile containment laboratory unit.

ECTS	Lectures	Seminars	Practical work	Digital learning	Personal work
5	28 hours	28 hours	14 hours		80 hours

Assessment method:

100% Written exam

Ungraded course work:

Risk Assessment

Scientific paper review.

Scientific Reading, Writing and Presentation

Organization: Hannover Medical School

Teaching unit coordinator: Jens BOHNE

Position: PhD Dr. Institute for Virology

Teaching unit outline

This module designed to teach masters students the skills to write a paper and master thesis also give a presentation of scientific data.

They will learn to use professional materials for presentation or publication.

Topics addressed

Searching the scientific literature; scientific writing style; writing graduate level papers, proposals, projects, and thesis components; preparing scientific presentations; presentation of data.

Key tools

Lectures on: skills to understand scientific papers, searching scientific literature, using scientific terminology and formatting, scientific writing style, communication the results of a review of the scientific literature, preparing professional materials for presentation and publication.

ECTS	Lectures	Seminar	Practical work	Digital learning	Personal work
3	21 hours	35 hours			34 hours

Assessment method:

100% Creating a scientific poster

Ungraded course work:

Oral presentation (Scientific paper)

Internship - Master thesis

The internship will last 6 months and can be done either as a placement in the industry or an internship in any full or associate partner institute.

The master's thesis will be written in English and defended in English as well during the annual workshop. The thesis defense lasts 30 minutes, including questions.

Assessment:

- Written dissertation: 50%
- Oral presentation: 20%
- Answers to the jury: 20%
- Supervisor evaluation: 10%

The evaluation grid used by the reviewers is the following:

	Mark	A	B	C	D	E	F
Dissertation writing	Grammar and spelling						
	Structure						
	Understandability						
	References and related work						
	Correspondence with the work done						
Oral presentation	Speaking style						
	Support						
	Structure						
	Understandability and pace						
	Summarisation						
	Correspondence with the work done						
	Subject mastering						
	Answer to questions						
Work and results	Amount						
	Use of knowledge acquired in courses						
	Originality and creativity						
	Critic spirit						
	Relevance to infectious diseases / One health						
	Scientifically valid arguments						
	Methodology						
	Weaknesses and further work findings						

Annex 3:

Associate Partners list

1. The Institut National de la Recherche Agronomique (INRA - France)
2. The Fédération de Recherche en Infectiologie (FÉRI- France)
3. The Institut de Recerca I Tecnologia agroalimentaries (IRTA-CReSA, Spain)
4. The Centre Pasteur du Cameroun (CPC, Cameroon)
5. The International Livestock Research Institute (ILRI, Kenya)
6. The Institute of Biochemistry (Romania)
7. Institut De Recerca De La Sida-Caixa
8. National Zoonoses and Food Hygiene Research Center
9. Robert Koch Institute
10. Fundacio Institut de Recerca en la Salut Germans Trias i Pujol (IGTP)
11. Institut de Recerca Vall d'Hebron
12. Biosciences Eastern and Central Africa - ILRI
13. Chiang Mai University
14. Universidad de Concepción Chile
15. Freie universität Berlin
16. Universidade de Sao Paulo
17. National Veterinary School of Tunisia Sidi-Tabhet
18. Washington State University
19. University of Copenhagen
20. McGill University (Royal institution for the advancement of learning)
21. Oniris - ENV Nantes
22. Iran University of Medical Sciences
23. Université de Conakry Guinée
24. Faculty of Veterinary Science, University of Pretoria
25. Stiftung Tierärztliche Hochschule Hannover (Hannover Vet School)
26. Sylhet agricultural university - Bangladesh
27. University of Edinburgh
28. Universidade Federal de Minas Gerais (UFMG)
29. Universidad Nacional de la Plata Argentina
30. Universidad de Las Fuerzas Armadas - ESPE
31. Amadeite-Olmix
32. Ascil Biopharm
33. Biomerieux
34. Boehringer Ingelheim VRC GmbH and Co
35. Calier
36. CEVA
37. CIEL: Centre for Innovation Excellence in Livestock Co
38. EFS
39. IDvet
40. Merck Sharp and Dohme
41. MixScience
42. Virbac
43. VirocoVax
44. Zoetis
45. Community Partners International (NGO) - Myanmar
46. Nigeria Center for Disease Control
47. Sukraraj Tropical and Infectious Disease Hospital

Supporting Networks

1. Emergin' (National infrastructure on the French roadmap 2018) Research infrastructure for the control of animal and zoonotic emerging infectious diseases through in vivo investigation
2. JAMRAI
3. VetBioNet
4. EJP One Health