e-Learning Course for Food Microbial Bioinformatician

Call for Applications

Contents

1.   Introduction

In the framework of the **Erasmus+ Programme**, the LEGO project bridges a growing educational gap in the field of High University Education by defining and training an innovative and interdisciplinary professional profile, called "**Food Microbial Bioinformatician**" (FMB). The FMB responds to the challenge raised by the advent of Whole Genome Sequencing (WGS), which is revolutionising research on Food Safety and Public Health protection.

The course developed within the project drives each student **towards the acquisition of the necessary knowledge and skills to become a FMB** through a learning path of the most relevant concepts for the world of microbiology and microbial bioinformatics.

In line with the European Credit system for Vocational Education and Training (ECVET) system and the European Credit Transfer and Accumulation System ('ECTS') used in the Higher Education Sector, the course is structured into **three** different multidisciplinary **eLearning modules** to facilitate the assessment and recognition of the acquired skills.

Each module is independent from the others in order to allow students to personalise their learning path and optimise, with flexibility, the time devoted to meet their training needs.

The present call for applicants aims at selecting and recruiting the participants in the pilot delivery of the e-Learning Course foreseen within the project.

2.   Value for beneficiaries

Candidates fitting with the criteria reported below (see section 5: Potential beneficiaries and requirements) will be admitted to the pilot edition of this E-learning Training Course. The participation is **free of charge**.

After passing the final assessment, foreseen at the end of each module, beneficiaries will receive an **attendance certificate** and an **open badge (**an international accepted virtual certification recognising and tracing their knowledge and skills across the web).

In line with the LEGO project purposes and outcomes, the certification of competences through the 'Open Badges' system promotes the recognition, transparency and comparability of skills - even informally or not formally acquired - across Europe and facilitates the exchange of researchers and professionals between university and the labour market, promoting also their mobility across Europe.

ONLY FOR THE ITALIAN PARTICIPANTS

ECM credits will be issued for the following professions: Veterinarians, Surgeons, Biologists, and Technicians of biomedical laboratories.

ADDITIONAL OPPORTUNITY FOR THE BENEFICIARIES BELONGING TO THE PARTNER UNIVERSITIES

For a selected group of students belonging to partner universities - the University of Helsinki (Finland), University of L'Aquila (Italy), University of Life Science and Technology (Bydgoszcz, Poland) -, the eLearning programme will be complemented by an intensive **10-day work training on the job at IZSAM** National Reference Centre for Whole Genome Sequencing of microbial pathogens: database and bioinformatics analysis **(Gen-Pat)***. 18 students (6 per each university partner) will be selected by the project Steering Committee among those who successfully completed the learning path (*at least acquiring the open badges related to module 1 and 2, and completing the eLearning module 3*) and will have the opportunity to apply their knowledge in a high-level work environment. One representative from each university partner teaching staff will participate as tutor in this learning-by-doing session.

The intensive training on the job will be held in August/September 2021. It will be replaced by online (or blended) training in case of restrictions due to COVID-19.

3. Course structure and organisation

The course is structured into **three independent modules**:

Module 1: Microbiological pathway

This module deals with the general concepts of microbiology, specifically the basic concepts of bacteriology and virology and provides with some insights about the most used conventional techniques in food lab routine activities. Furthermore, the workflow of the omic-sciences is treated in depth.

Duration: 300 hours (25% of the course)

Module 2: Bioinformatics pathway

This module provides with an introduction to programming languages and to WGS data, deals with the various phases of the Dry Lab, as WGS data and comparative analysis, and related bioinformatics tools.

Duration: 300 hours (25% of the course)
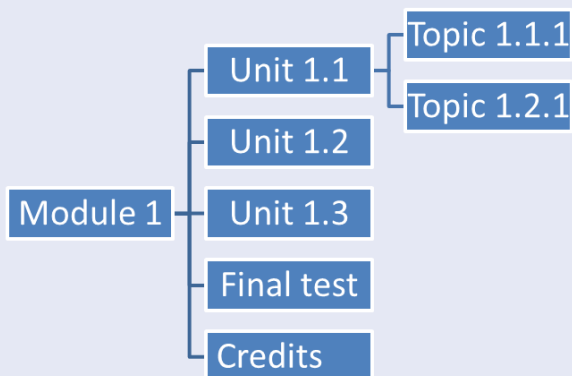
Module 3: Core-competence pathway

This module is divided into 3 units:

- Introduction on Food Safety. This part is an introduction to the general aspects of Food Safety in Europe such as the protagonists in the control of food safety, legislation and related economic impact. Furthermore, the current developments and discoveries in Food Microbiology using Next-Generation Sequencing (NGS) techniques are treated.

- Major concern Pathogens. In this part, the food-borne pathogens representing the major concerns for Public Health such as Campylobacter *jejuni*, Salmonella *spp*, *L. monocytogenes*, E. coli STEC and Hepatitis E virus are discussed.

![Lego - learning genomics for food safety]

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- WGS applications. In this part, it is explained how the -omic sciences can represent an essential support for public health surveillance, molecular epidemiology and risk analysis. The basic concepts and procedures to analyse the transmission pathways and trace sources of epidemic infections as well as to evaluate microbial virulence and determinants of resistance to antimicrobial drugs are illustrated.

Duration: 600 hours (50% of the course)

As reported in the Image below, each module is divided into different **units** covering different **topics** including texts, audios, pictures, videos and interactions.

```
                                        ┌── Topic 1.1.1
                          ┌── Unit 1.1 ─┤
                          │             └── Topic 1.2.1
                          ├── Unit 1.2
        Module 1 ─────────┼── Unit 1.3
                          ├── Final test
                          └── Credits
```

Beneficiaries have the opportunity to study autonomously and with flexibility, adapting the learning path to their personal and professional needs along the training period defined and detailed below (see sections 4 and 8).

The course is delivered in **English** through the **IZSAM E-Learning** Platform (https://elearning.izs.it).

4. Duration and timetable

The estimated time for the **entire** course completion (including the technical self-assessment, self-learning sessions, project works, tests and interactive activities with tutors and other participants, participants' satisfaction on-line survey, in depth materials) is calculated in **1200 hours** (See annex "A" for further details).

The technical self-assessment (see section 8) will allow beneficiaries to identify their training gaps and follow the most appropriate module(s) according to their needs.

The course will be delivered from the **15 March to the 16 July 2021**. In particular:

Module 1 will be available since **15 March 2021**

Module 2 will be available since **15 March 2021**

Module 3 will be available since **13 April 2021**

5. Potential beneficiaries and requirements

The elearning course will involve at least **120 trainees** from **European Universities**. They should be enrolled in a **second or third cycle studies** in one of the following disciplines:

- Veterinary Sciences, Animal Sciences, Bioinformatics, (Micro)biology, Biotechnologies, Public Health, Agronomics, Biomedical Engineering and **Medicine** (or equivalent degrees)

or

- Statistics, Informatics, Mathematics (or equivalent degrees). In this case, they should also have some **research experience** in the field of Microbiology.

In addition, the course will be also opened to at least **80 professionals** (microbiologists, biotechnologists, bioinformaticians, epidemiologists, veterinarians, statisticians, etc.) having at least a **three-year work experience** and willing to enter into a formal educational path for the recognition of their competences in the field of genomics and food safety.

All students and professionals involved should also:

- be **motivated** to undergo the training path and to disseminate the project initiatives

- have good knowledge (at least B2 level) of **English** language

- pass the **technical self-assessment** (see section 8)

6. Enrolment procedure

Applications can be submitted using the following link: https://it.surveymonkey.com/r/legoproject

An automatic message will confirm applicants the submission of their request.

One week after the closure of the enrolment phase, applicants will receive an official communication about the admission results.

An internal procedure will be carried out to compare the profiles of the applicants with criteria reported in section 5 of this call.

7. Deadlines

The enrolment procedure will close on the **28 February 2021**

8. Technical self-assessment

After the admission, participants will be required to complete a technical self-assessment questionnaire.

This preliminary questionnaire will allow beneficiaries to **self-evaluate their knowledge and skills** - acquired through formal, informal and no formal learning - and to compare them to the ones described in the standardised FMB profile, defined according to international quality standards and transparency criteria.

Once knowledge and technical skills gaps are detected, users will have the opportunity to follow the **most appropriate elearning module(s) to meet their training needs**.

On the basis of the results obtained, participants will have different possibilities:

- Beneficiaries having correctly answered to **at least 35% of all technical questions**: admission to the course

- Beneficiaries having correctly answered to **at least 75% of the technical questions related to a specific module**: possibility to **directly complete the assessment test** foreseen at the end of the specific module to **obtain the competence certificate/open badge**. This possibility is in particular oriented to professionals wishing to **certify knowledge and skills even informally or not formally acquired**.

In any case, once the minimum threshold of 35% has been achieved, participants are free to be enrolled in all the module(s) they are interested in, and the training contents will be at disposal of beneficiaries for refreshing some specific subjects they may need.

9. Final module assessment

Assessment is an integral part of the learning process. In order to assess the achievement of each module's learning objectives, different evaluation tools are used at the end of each module, as detailed below:

Modules	Evaluation tools	Time
Module 1	Multiple-choice knowledge assessment questionnaire	About 1h to be completed
Module 2	Case study or a simulation	About 5h to be completed
Module 3	Final project work	About 20h to be completed

10. Satisfaction questionnaire

At the end of the course, participants will be asked to complete a satisfaction questionnaire aimed at collecting feedback and improving suggestions about the learning path concluded.

11. Certificates and open badges

For each module, after passing the final assessment foreseen, beneficiaries will receive an **attendance certificate** and an **open badge**.

12. Contacts details

LEGO Lead Partner and eLearning Training Provider:

Istituto Zooprofilattico Sperimentale dell'Abruzzo e del Molise (IZSAM)
Campo Boario
64100 TERAMO (ITALY)

Please contact **lego@izs.it** for information regarding the eLearning course, including enrolment inquiries.

Please visit www.learngenomics.eu to know more about the LEGO project and the e-Learning Course.

Annex A: Estimated time for the entire course completion**

Estimated time for the entire course completion	1200 hours
Estimated time for the entire course completion taking into consideration the student *minimum* pre-existing background	780 hours
Estimated time for module 1 completion	300 hours
Estimated time for module 1 completion taking into consideration the student *minimum* pre-existing background	200 hours
Estimated time for module 2 completion	300 hours
Estimated time for module 2 completion taking into consideration the student *minimum* pre-existing background	200 hours
Estimated time for module 3 completion	600 hours
Estimated time for module 3 completion taking into consideration the student *minimum* pre-existing background	400 hours

including the technical self-assessment, self-learning sessions, project works, tests and interactive activities with tutors and other participants, participants' satisfaction on-line survey, in depth materials