

# **BIP PROJECT:**

## **Sustainable Biotechnology Entrepreneurship: Microalgae & Human Food**

### **COORDINATION:**

Tania Mazzuca Sobczuk, Universidad de Almería, tmazzuca@ual.es

## **1.TARGET GROUPS**

The program described in this syllabus, is intended for Undergraduate and Master students from different disciplines related to business, economics, management, chemical engineering, environmental science/engineering, food technology. It is required to communicate well in English, but no certification is required. Students with special needs will have priority, provided that they can/have the tools to communicate well in English.

Students must be joined in teams of at least 5 participants, from at least 3 different countries and 3 different disciplines. This aspect must be considered during student selection.

From another perspective, participation is also open to staff and prospective staff wishing to learn about microalgae culturing, teamworking and BIP's development. For this purpose, staff will participate in on-line meetings with the coordinator and will attend the in-person training period. Clearly, ECTS recognition is not applicable to this group and attendance is conditional to obtain a STT Erasmus grant or similar. The individually designed learning agreement will describe personalized activities in detail.

## **2.OBJECTIVES**

### **Knowledge**

Upon completion of this program, participants will be able to:

1. Address the most important aspects to plan a microalgae production project that contribute to the development of the SDGs.
2. Argue the best location for algae culturing and business location from a transdisciplinary point of view.
3. Adapt the business idea or production project design according to the main values that underlie the public concern in the different countries (such as perceptions of trust, need, taste and care for a sustainable society and natural balance).
4. Decide between different business organizations for the development of microalgae-based products in different countries.

## Skills

Upon completion of this program, participants will be self-confident enough on:

1. Problem-solving skills in developing transdisciplinary solutions.
2. Critical-thinking and analytical skills.
3. Time management and tasks prioritization during individual and teamwork.
4. Understanding technical information and clearly explaining it through oral and written reports intended to audiences from different cultural backgrounds and disciplines, at different times and for different purposes.
5. Interpersonal skills for teamwork with professionals from various contexts (disciplines, countries) to develop a common biotechnology-based project.

## Values

Upon completion of this program, participants will have experienced activities that will help them in

1. Identifying personal training needs with an open, critical and reflective attitude about expected professional performance
2. Conducting proficient intercultural communication
3. Constructing a professional role in relation to personal values, behavior and communication styles
4. Articulating a complex understanding of the cultural environment to be aware of values, customs and practices common in other cultures that might be relevant for their own performance in a multicultural environment.

According to the teaching plan, the development of the objectives is expected to be in line with the calendar described in Table 1.

Table 1. Expected calendar for the development of the objectives according to the teaching plan.

MONTH	WEEK	OBJECTIVES												
		KNOWLEDGE				SKILLS					VALUES			
		1	2	3	4	1	2	3	4	5	1	2	3	4
MARCH	1							X			X	X	X	X
	2	X						X		X		X	X	X
	3	X									X	X	X	X
	4	X				X		X		X		X		X
APRIL	1	X				X	X	X	X	X	X	X	X	X
	2	X	X	X	X	X	X	X	X	X	X		X	
	3	X	X	X	X			X	X	X	X		X	
	4	X	X	X	X			X	X	X	X	X	X	X
MAY	1		X	X	X			X	X	X	X		X	
	2		X	X	X			X	X	X	X		X	
	3							X	X	X			X	
	4					X		X					X	
JUNE	1					X		X						
	2					X		X						
	3							X	X					
	4							X	X					
JULY	1					X	X		X	X		X	X	X
	2					X	X		X	X		X	X	X
	3					X	X		X	X		X	X	X
	4					X	X		X	X		X	X	X

### 3. Organizational aspects of the BIP

#### Recruitment

The partner Universities will recruit students from areas related to Economics, Management, Chemical Engineering, Environmental Science, Food technology or any other studies that could participate in the development of the project. One possible strategy could be, for example, to send an open call for students of undergraduate and master studies from studies related to those disciplines. The total number of students participating from the partner Universities will initially be 25, to anticipate any

possible dropout before mobility. Apart from partner universities, non-European Universities will be invited to participate in the BIP (1 – maximum 2 students) in order to increase, even more, the cultural diversity of the groups. Students from the University of Almeria will also be invited to participate, as it is important for the UAL to make use of this action to promote internationalization within the community.

In figure 1 there is one of the multiple possibilities for distributing participants among different universities and areas considering that 4 partner Universities participate in the BIP (in the example neither students from UAL nor students from third country universities are represented). Students with special needs are encouraged to declare their condition during the application process to prepare specific adaptations for both the online and in-person training periods.

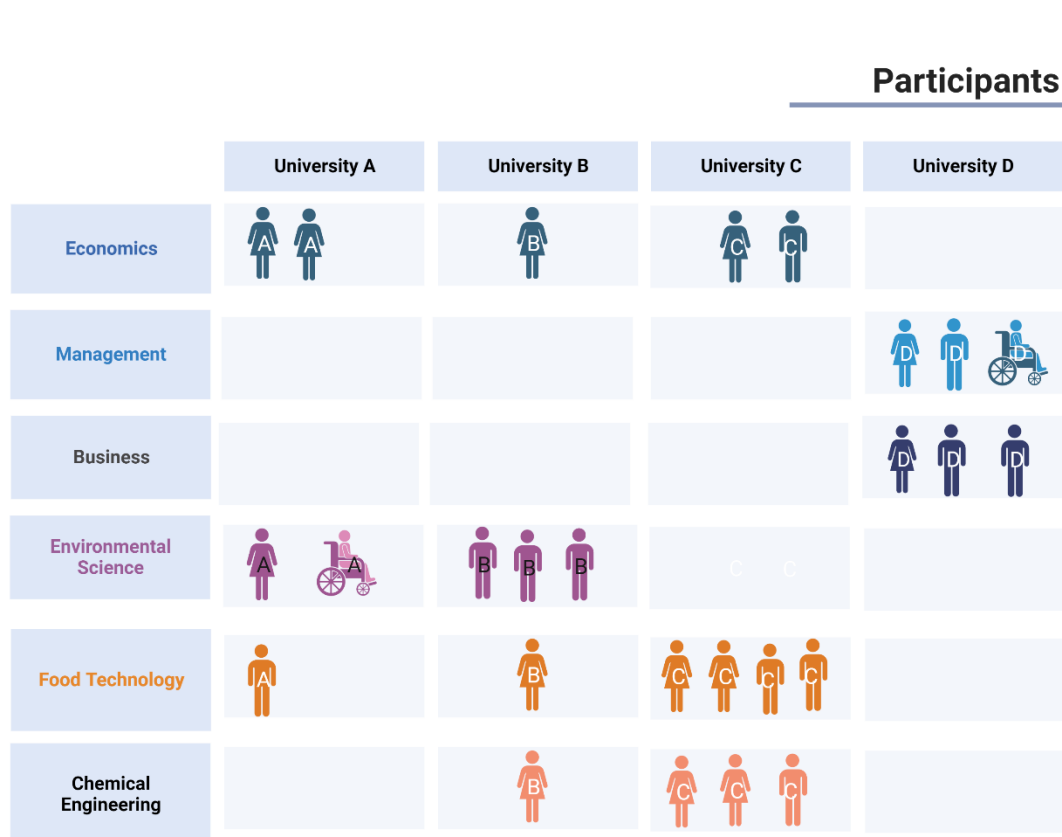


Figure 1- Example of participant distribution among universities and areas. Each University is identified by a letter (A, B, C, D) and all of them are ideally located in different countries. Blue, cyan, and grey symbols identify students from Economics, Management and Business (Disciplinary Area X); Pink, orange and violet symbols identify students from Chemical Engineering, Food technology and Environmental Science (Disciplinary area Z). Furthermore, 3-4 students from University of Almeria and 1-2 students from each of the following third countries: Japan, Canada, Argentina, Perú and Costa Rica, will be asked to participate in order to increase, even more cultural diversity.

## Before kick-off:

This is a compulsory necessary part of the course before the official kick-off (First General session: 1GS).

All the participants (students, mentors and teachers) must individually sign-in to the platform and explore the different tools. Asynchronous training will take place to get familiar with the online platform, available for students, mentors and teachers. Students will be asked to complete their initial diagnosis of intercultural competence development. Additionally, students must follow the training for Blackboard use.

### Blackboard contents:

- Signing into the platform (before the first online meeting)
- Accessing the videocall (before the first online meeting)
- Moving through the different groups in the videocall (before the first online meeting)
- Learning how to post in blogs (before the first online meeting)
- Learning to use tool groups.

The assessment might be taken, for example, by a gymkhana-like activity or virtual scape-room challenge.

Mentors will have their own discussion forum (not available for students) and will agree on their mentoring style. Teachers will send the video material to the coordinator to be uploaded to the platform.

## Adaptation to contingencies

In the unlikely case that the number of students at the beginning of the mobility is lower than 16, partner universities will be asked to open a new call and a second set of students will join the BIP in order to balance the groups. The virtual period of those students will start before the mobility by studying the different groups' project ideas, finding the weaknesses and strengths of the projects, and planning their contribution to the project development. The virtual period for this second group of students will be extended after the mobility takes place and will consist in improving the final project's product.

## 4. Teaching philosophy

### Virtual exchange period

Virtual teaching is designed in such a way that at the end of the period the students will **gain a deep understanding of a complex problem**. The objective of each team is to **address goal 2 of the SDGs** (Sustainable Development Goals) “End hunger, achieve food security and improved nutrition, and promote sustainable agriculture” **by developing a project using microalgae**. To do that, each team will need to **decide the main idea of its project and complete a project template** where location, objectives, etc...will be addressed. Monthly, they will **report their achievements and difficulties to their team mentor**. Not only the project will be developed during the online period, but will the online exchange bring students the opportunity of **improving their intercultural competence** and to develop the skills to be able to cope with the sort of situations they are likely encounter during the physical exchange period. For this reason, **the intercultural competence will be assessed before and after the virtual period, and anecdotic evidence will be reported individually in the portfolio**.

### In- person training period

The activities for the face to face part are designed to **allow interaction with professionals from outside academy**, performing activities related to microalgae culturing and processing, animal feed, food technology and cooking. Professionals from **academy will bring the knowledge and feedback needed for improving their projects**.

## 5. Student's activities

The methodology is based on student's work, supported by mentors, teachers, and coordinator. Evidence of work brings to mentors and coordinator the opportunity to follow up the team process.

### After acceptance in the BIP

**Individually signing-in to the platform and exploration of the different tools (videocall, blogs, groups) is a compulsory necessary part of the course before**

**the official kick-off** (First General session: 1GS). It will allow students to interact through the platform and have access to contents, announcements, assessments, etc.

## During the course

### 1. Activities under mentor-coordinator supervision:

- **Two online general synchronous sessions:** one at the beginning (~March, 1<sup>st</sup>, identified later in this document as First General session: 1GS) and the second one around 2 months before mobility (~ May, 10<sup>th</sup>, identified here as Second General session: 2GS). It is intended for all the participants with the general coordinator (Tania Mazzuca).
- **Monthly online mentoring sessions,** for each interdisciplinary team, are proposed for the virtual exchange of the participants. The sessions will be dated by the mentor and the team within the interval of one week of the date suggested by the general coordinator. The sessions are identified later in this document as: Second formal online meeting (Session 1IT+M), Third formal online meeting (Session 2IT+M) and Fifth formal online meeting (Session 3IT+M).
- **In-person training period, of 10 days in Almeria (July).**

2. **Interaction in disciplinary groups** (students of the same discipline but different group) **and discipline teachers,** using the communication tools and virtual spaces provided by the coordinator (groups, forum, online sessions, etc...).

### 3. Non-supervised activities:

Students need to **meet online as a team, at least once a month.**

Students need to **self-study and self-assess,** studying the teaching material, searching information, filling the assessment's forms and preparing portfolio.

Students are responsible of **applying to their home International Offices for the obtention of Erasmus grant** to attend the in-person training period in Almeria.

Students to do the **arrangements for accommodation and travel.**

## Brief description of the activities that the students need to attend:

During the synchronous **first online session (1GS),** students get to know each other by ice-breaking activities. Multidisciplinary work groups are created, including

members from most of the universities and involved areas. Once **mentors are assigned to each group**, all the interdisciplinary groups will separately discuss their project idea proposal. From that point on, the **interdisciplinary teams will work on the development of their project idea on their own**. The philosophy of the BIP is to encourage students from the different disciplines to analyze the project idea under a transdisciplinary perspective necessary to solve complex problems. They must deeply analyze the factors that might affect the effectiveness of the project implementation and explain that perspective to the other members of the team, building together the best possible project idea.

The interdisciplinary groups will meet monthly with their team mentor by internal agreement of time availabilities, so the mentor will oversee collaboration between members of the group, delivering support and advice (See full description of the online sessions under the paragraphs entitled **Sessions 1T+M, Session 2T+M, Session 3T+M**).

Students will develop their team project as they wish, including compulsory online team meetings, working in disciplinary teams (optional) and individual work (compulsory) to meet the tasks. The formal meetings with coordinators and mentors can be preferably recorded and placed on Blackboard platform. Recording is especially important for tutor-team meetings.

## Self study

**Didactic material (15-20 minutes video pills)** related to each main concept required to understand the complexity of the project will be available on the platform in the form of “pills” (15-20 minutes video). Each team will distribute the contents among members, according to their own interest, as the pills will be mainly related to marketing, economics, or biotechnology. After that, each member will explain their perspective to the other members of the interdisciplinary team.

## Disciplinary subgroups (optional)

Students can discuss the pills with people from other groups analyzing the same pills. The coordinator can create disciplinary working areas on the platform to favor disciplinary team formation and discussion within members and/or with the teacher.

As the main activity of the groups must be discussing and interacting, only around 4 to 6 pills by discipline will be proposed. The **teaching team** responsible for the didactic material will be **available at the platform**, for answering students' questions, within a period of time that will be communicated to students by the platform.



**It is compulsory to perform the following scheduled activities:**

- **signing up on the Blackboard before** online period begins (if possible)
- **attending most of the 5 online supervised meetings** (with mentors or coordinator), **4 online team meetings** (students only) **and the final presential period** of training to be held in Almeria, Spain.
- **uploading the different tasks:** short videos, blog, assessment forms, etc.

**Compulsory evidence for grading (4ECTS):**

- **Individual self-assessment** (filling the assessment forms **at 3 different times** (before the BIP, after the online period and after the in-person period, to check evolution) and **portfolio completion twice**: after the online period and after the in person period).
- **Check-list of tasks completion at the end of the online period.**
- **Online tasks:** a *short video* introducing themselves (individual), a *video introducing the project' idea* (groupal), comments in other's videos (individual), and *interaction* with members of other teams (*disciplinary groups*) and *pill's teachers* for the understanding of the online pills.
- The **project template** is completed and presented as a team **twice** to the coordinator: at the end of the virtual exchange period (provisional project) and at the end of the in-person training period (final project template).
- **Assessment of the BIP** at the end of the in-person training (student's opinion about the program and learning goals)
- **Dissemination activities** (as a team or individually) at the end of the BIP.

**Fees and grants**

**No fees** are required to enroll and participate in this program.

A number of **Erasmus grants** has been agreed between UAL and the partner European universities (**student home universities**). It is responsibility of the participant to apply on time for obtaining the grant, under the guideline of their respective home universities.

The **learning agreement content** necessary to apply for the Erasmus grant **can be extracted from this document and sent for signing to the host international office.**

**Trip to Almeria and accommodation issues** are organized by the students. A general meeting will take place in advance to give advice for this end.

**Students must arrange transport to the UAL campus**, accessible by bus from the city and/or in the city center. **Transport will be arranged by the organization, free of charge, for activities outside the city.**

## 6. FULL DESCRIPTION

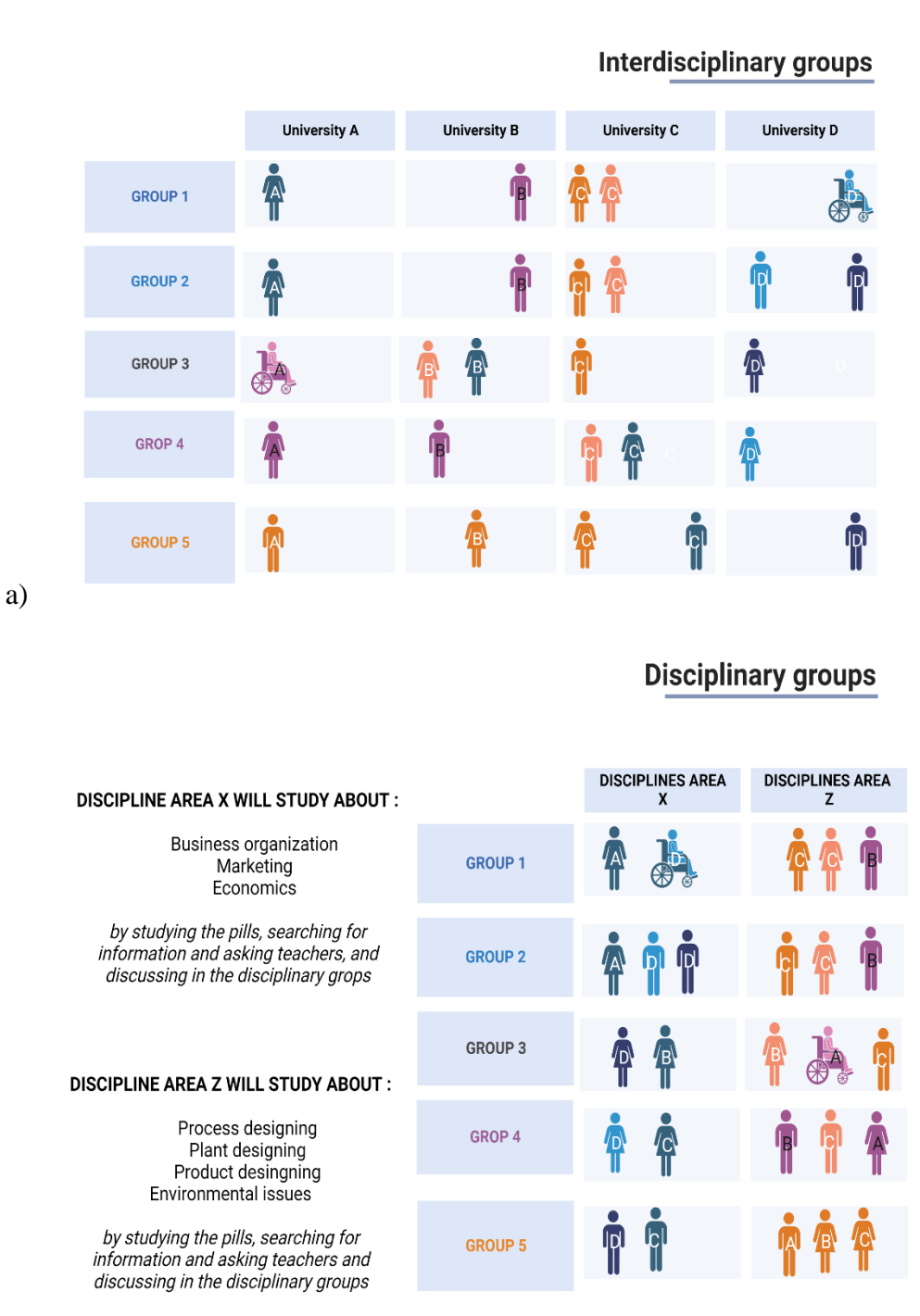
### Teams and groups

In Figure 1 there is represented the diverse home universities and disciplines of study of the participants of the BIP. In the other side, in figure 2a, it is represented a possible distribution of the members in **multi-national- multi- disciplinary teams** (called group 1, group 2, group 3, group 4 and group 5) according to that scenario. These teams will be created during the first general session, under the supervision of the coordinator, and a tutor will be assigned to each group.

During the online part, students must watch, understand, and explain to the other members of the team, the selected pills (by agreement with mates. Students can potentially discuss the pills with people from other groups analyzing the same pills. The coordinator can create disciplinary working areas on the platform to favor **disciplinary teams** formation among the different multi-national-multi -disciplinary teams.

As the main activity of the groups must be discussing and interacting, only around 4 to 6 pills will be proposed for each by discipline. Potential titles are shown in table 2. The **teaching team** responsible for the didactic material will be either **available at the platform, synchronously** at least once as well as asynchronously for answering students' questions, or during the in-person training period.

The organizational aspects of the teaching methodology are resumed in Figure 2, where the two different possible student aggrupation's during the Blended Intensive Program are shown: inter-disciplinary groups (Figure 2 a) for developing the projects' idea with their correspondent mentor, as well as the optional disciplinary groups (Figure 2 b), to make the best disciplinary contribution to each project development.



b)  
 Figure 2: Online part organizational aspects. 2a: Interdisciplinary teams for developing their project ideas. 2b: disciplinary teams for improving the disciplinary approach contribution to the problem solution.

Table 2: Potential pills available for students at the Blackboard platform (example).

CODE	TITLE
OT1-	Potential commercial products from microalgae with emphasis on food.
OT2-	Factors influencing algae growth.
OT3-	Bioreactors for microalgae culturing: pros and cons.
OT4-	Techniques for cell separation: pros and cons.
OT5-	Safety regulations in microalgae for human consumption and animal feed.
OT7-	Factors to consider when profiling consumer segments.
OT8-	Defining marketing strategies according to the target groups.
OT9-	Strategic planning and management systems.
OT10-	Small scale farming: Collective vs familiar farming organization.
OT11-	Large scale farming: potential business organizations.
OT12-	Factors influencing consumer's acceptance of food products.
OT13-	Consumer's acceptance.
OT14-	The right to food and the right food.

## IN-PERSON TRAINING

**FROM 09/07/2023 al 19/07/2023 (10 days)**

General description of activities

At every morning, the students will have preferably no more than 3 hours of workshops and lectures (specifically no more than 1 hour of traditional lecture, being the other workshops), at demand, teamworking time, and other learning experiences (such as visits, cooking sessions, etc....). After lunch students will need to prepare some activities for the next day.

A tentative working plan is:

## DAY 1 (Tuesday):

- *9:00-Close to South bus stop*: Reception and on campus orientation (UAL)
  - Visiting Sport and recreation center, Dining halls, etc....(UAL)
  - Visiting Chemical Engineering Department facilities: Naves, Pilot Plant and inoculum's camera. Lecture: Type of bioreactors. (UAL)
- *10:30-Classroom/Computer lab*: Teamwork- Prepare a graphic answer to the question: how diverse is your group? Preparing the presentation/(Lessons on demand).
- *12:00-Break*
- *12:30-Classroom/Computer lab*: Answer the question: how diverse is your group?
- *13:00- Classroom*: Project template presentation. (UAL)
- Afternoon/evening. *City center*: cultural activity visiting the city (Alcazaba, Cathedral, etc....)

## DAY 2 (Wednesday)

- *9:00-Close to North bus stop*: Visiting a microalgae production plant (UAL - IFAPA)
- *10:30- Classroom*: CANVAS MODEL (workshop) (UAL)
- *12:30-Break*
- *13:00- Classroom*- Lessons on demand. From the portfolios (for the online part of the BIP), select the best anecdote to share tomorrow with the rest of the group based on diversity. Prepare some visual/auditive material to share.
- Afternoon: individual work (UAL if classrooms are available)

## DAY 3 (Thursday)

- *9:00- Classroom/Computer lab* Teamwork. (UAL)
- *10:00-* Visiting a pellet production facility (UAL)
- *11:30-* break
- *12:00- Classroom/Computer lab*: Teamwork. Lessons on demand. (UAL)

- *13:00- Classroom* Sharing the best (1-3) anecdotes from portfolio of each team to the total group. Discuss about the cultural/linguistic/disciplinary component.
- Afternoon: individual work - Cultural activities

## DAY 4 (Friday)

- *9:00- Kayak in Cabo de Gata*

## WEEKEND

- Individual work and teamwork/ free time

## DAY 7 (Monday)

- *9:00-Classroom /Computer lab* Teamwork. (UAL). Lessons on demand.
- *10:30-Classroom /Computer lab.* Formative assessment of the projects and teamwork peer assessment.
- *12:00-Classroom /Computer lab.* Lessons on demand. Preparation for discussing the content of the pills.
- *13:00- Computer lab* Teamwork -*Pills discussion* (at least one member of each group discusses online the content of 2 or 3 pills)
- Afternoon: teamwork (UAL if classrooms are available)

## DAY 8 (Tuesday)

- *11:00-Meet at LIDL-Rambla de Almería.* Cooking with microalgae (workshop) The main idea is to use and taste microalgae in different dishes and to learn how the use of microalgae affects the quality of the fish and its preparation (Escuela de Hostelería- dining room facilities)
  - Afternoon: teamwork

## DAY 9: (Wednesday)

- *9:00-Classroom /Computer lab* Teamwork. (UAL). Teamwork
- *10:00- Classroom* Lessons on demand

- *11:00- Classroom. Explanation of the project presentation and the closing activity for the last day.*

*Project presentation:*

- 10-15 minutes of Power Point oral presentation informing their projects and CANVAS.

*Closing activity about achievements during the BIP (knowledge, skills or values). To be selected between the different formats:*

- Video illustration: to draw drawings or diagrams with the most relevant learnings (regarding knowledge, skills or values) and, with the help of a video camera, take shots of the sequence and include the narration of what they consider the most important points.
- Book cover: to design the front and back covers of their projects. Writing the prologue where they briefly explain why it is important to know the content of the project and how it can be applied in practical life.
- Elevator Pitch: to summarize the most important points of their participation in the BIP or their projects, in 60 seconds and present them in a video to the group (TIK-TOK, Flip, etc...).
- Musical Summary: to compose a song about the most important learnings.
- Open form: to be proposed by the students (5 minutes limit)
- *12:00-Break*
- *12:30-Classroom / Computer lab -Pills discussion (at least one member of each group discusses online the content of 2 or 3 pills with the online teachers).*

## **DAY 10: (Thursday)**

- *9:00-Classroom / Computer lab Teamwork. (UAL).*
- *10:00-Classroom. Final presentation of the project templates.*
- *11:30- sending information for grading:*
  - *Definitive project template*
  - *Power Point of the presentation*
  - *Autobiographic information (final)*

- 12:00-Break
- 12:30-Classroom.
  - Sharing the closing activities.
  - Student's assessment of the BIP (form-interview)
  - Dissemination activity: each student (individually or collaboratively) produces a dissemination activity to spread the content/ dynamic/ benefits of doing the BIP. Upload it as activity in Blackboard.

*After the in-person training:*

- External Assessment of the BIP (UAL). Students will receive feedback on their projects.

## Integration and assessment

Students are expected to actively participate in online meetings and discussions, as well as in the mobility period. The responsibility of the students over their learning will be increasing from the beginning of the project to its end.

Professor will supervise the first meeting and most of the following, in order to facilitate the introductions and communication, and will also give feedback about the different documents, videos, etc.... produced during the experience

Students will **write a portfolio** narrating their experience, keeping records of experiences that have contributed to their progress and reflecting on the knowledge acquisition process.

At the beginning of the course, **Biographical Information** about previous intercultural experiences will be recorded as well as at the end of the BIP (both on-line and in-person periods). During the course, evidence of intercultural competence acquisition will be described and by the end of the course, an assessment session will be held detailing the experience (number of new multicultural contacts, acquired knowledge, assessment of the communication, shared expressions in the wiki, etc.).



Finally, students will design and develop the way in which they will share their experience with other students of their home/host Universities, in order to disseminate the benefits of their multinational/multidisciplinary experience.

## GRADING AND COMPULSORY ACTIVITIES TO GET THE

### 4 ECTS PROPOSED

- In-person training period of 10 days (never shorter than 5 days) is compulsory.
- Before the in-person training the student will fill in the personal assessment form. There, they will check that they have completed all the required activities. It comprises the assessment of the activities during the meetings with the coordinator and mentor as well as the teamwork.
- Mentors and coordinator will need to approve the student assessment according to their records.
- Students need to obtain at least a mark of 50% (2,5 p) in online period.

The highest possible mark FOR THE ONLINE PERIOD is 5P, proportionally to the punctuation in the assessment form and mentor's and coordinator's observations.

During the in-person training period:

- Attendance (1P)
- Participation (2P)
- Final reports (2P)

Highest possible mark FOR THE IN-PERSON TRAINING PERIOD is 5P.

## RESUME OF STUDENTS' WORKLOAD

Online period:

- Meetings/teaching: 2 hours/month
- Teamwork 2 hours/month
- Individual work: 5 hours/month

Per month: 9 hours; March-June: 4 months; **Total: 36 hours**

In person training:

- 8 hours/day
- 8 lective days (excluding weekend):

Total: 64 hours

Total student dedication's time: 100 hours, included 48 teaching hours:

**Equivalent to 4 ECTS**