

D 3.1

TRAINING MATERIAL

WP 3: ACADEMIC STAFF TRAINING AND PREPARATION
FOR DELIVERY



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Executive Summary

The report provides an overview of the online platform in terms of user requirements, developed features, content structure and methods of delivery. The results of the design and development of the platform along with the online hosted content are described in following Chapters:

- Chapter 2 presents the adopted methodology focusing on instructional design aspects and the different phases of design and implementation.
- Chapter 3 provides the technical overview of the web application: architecture, open-source software, installation methods and the main system components.
- Chapter 4 lists the main features of the platform from a navigational point of view, the functionalities offered by the platform, the structure of the content and the different methods of delivery.
- Chapter 5 provides details on the features for the online course management to be used by the members of the FOODI Course Team (FCT) during the MOOC lifetime.
- The last Chapter illustrates the FOODI professional training in numbers, using data gathered from the analytics API.

Dissemination Level		
PU	Public	X
PP	Restricted to other programme participants (including Commission services and project reviewers)	
CO	Confidential, only for members of the consortium (including EACEA and Commission services and project reviewers)	

1 INTRODUCTION

The MSc Food Processing and Innovation program is a prime example of the CBHE program's impact. Developed in collaboration between European and partner country institutions, this program addresses the growing demand for skilled professionals in the field of food processing. With a focus on innovation and sustainability, it equips students with the knowledge and skills needed to excel in the dynamic and ever-evolving food industry.

Fundamentally, instructors are linchpin in thriving the MSc FOODI. For MSc FOODI, this has become even crucial as its philosophy and mission lies in its inherent intention to promote innovation and dynamism for the future of the food industry. Instructors are key in determining the process of imparting knowledge, nurturing skills, and shaping the perspectives of learners within the scope of MSc FOODI to evolve effectively.

Against such a background, the FOODI consortium develops these training materials collectively during the project lifetime. We build a compendium of materials to be used for the MSc FOODI programme, as well as supporting further development of modules for the FOODI professional training. Project partners in Asia who implemented the MSc FOODI created this set of materials according to the Institution requirements. For this reason, the material is somewhat heterogeneous in format and contents.

It is hoped that these documented materials which are designed according to specific nuances of FOODI institutional partners would support:

- **Comprehensive Content:** The materials cover a wide range of topics related to food processing and innovation, including the latest advancements, best practices, and emerging trends.
- **Pedagogical Support:** Effective teaching is about more than just content delivery. These materials offer insights into various pedagogical approaches, assessment methods, and classroom management techniques tailored to the unique needs of this program.
- **International Perspective:** The Erasmus CBHE program promotes an international outlook, and these materials reflect that ethos. Materials are supposed to add guidance on fostering a diverse and inclusive classroom environment and encouraging cross-cultural learning experiences.
- **Continuous Improvement:** The field of food processing is dynamic, and so is education. These materials are not static; they are designed to be updated and adapted as the industry evolves. Instructors are encouraged to seek further references, perform continuous research with industry and other academic communities in order to keep them current and relevant.

These supporting materials are developed into several sections. The next succeeding sections offers approaches in delivering MSc FOODI. This includes discussion on innovative teaching and learning, effective class management, industry-internship as well as design thinking approaches to performing research. Next, we openly discuss the practices of our Asian partner institutions in delivering MSc FOODI. Finally, we conclude with several reflections and recommendations.

1.1 Approaches to Delivering MSc FOODI

Innovative Teaching and Learning

Innovative teaching and learning for a transdisciplinary masters program can be implemented through a variety of methods, including:

- Inquiry-based learning: This approach encourages students to ask questions, explore different perspectives, and find their own answers.
- Problem-based learning: This approach presents students with real-world problems that they must solve using their knowledge and skills.
- Project-based learning: This approach requires students to complete a complex project that integrates their learning from different disciplines.
- Service learning: This approach combines academic learning with community service, giving students the opportunity to apply their knowledge to real-world problems.
- Experiential learning: This approach involves hands-on learning experiences, such as field trips, internships, and simulations.

These methods can be used to create a learning environment that is collaborative, interdisciplinary, and student-centered. They can help students to develop the critical thinking, problem-solving, and communication skills that they need to succeed in today's complex world.

Here are some specific examples of how these methods can be used in a transdisciplinary masters program:

- In an inquiry-based learning course on food sustainability, students might be asked to research the environmental impact of different food production methods. They could then work in groups to develop a plan for reducing the environmental impact of their own food choices.
- In a problem-based learning course on food security, students might be presented with a case study about a community that is facing food shortages. They would then work together to identify the causes of the food shortages and develop solutions.
- In a project-based learning course on food entrepreneurship, students might be required to develop a business plan for a new food product or service. They would need to conduct market research, identify their target customers, and develop a marketing strategy.
- In a service learning course on food justice, students might volunteer at a food bank or soup kitchen. They would gain hands-on experience working with people who are food insecure and learn about the challenges they face.
- In an experiential learning course on food science, students might participate in a field trip to a food processing plant. They would see how food is produced and learn about the different technologies that are used.

These are just a few examples of how innovative teaching and learning can be used in a transdisciplinary masters program. By using these methods, students can develop the skills and knowledge they need to address the complex challenges of the 21st century.

In addition to the methods mentioned above, here are some other considerations for innovative teaching and learning in a transdisciplinary masters program:

- Use of technology: Technology can be used to facilitate collaboration, communication, and access to information. For example, students can use online platforms to work together on projects, share resources, and communicate with instructors and classmates.

- **Active learning:** Students should be actively engaged in the learning process, rather than passively listening to lectures. This can be achieved through activities such as group discussions, case studies, and simulations.
- **Assessment:** Assessment should be authentic and meaningful, and it should reflect the learning goals of the program. This could involve projects, presentations, portfolios, and other forms of performance-based assessment.
- **Reflection:** Students should be encouraged to reflect on their learning throughout the program. This can be done through journaling, self-assessment, and peer feedback.

By incorporating these elements into their teaching and learning, instructors can create a transdisciplinary Master's program that is both innovative and effective.

Effective Class Management

Effective class management for a transdisciplinary Master's program is the ability to create and maintain a positive learning environment where students from different disciplines are engaged and productive. It is a critical skill for all instructors, regardless of the subject they teach.

Here are some tips for effective class management in a transdisciplinary Master's program:

- Be clear about the learning goals of the program. Students from different disciplines will have different expectations for what they will learn in the program. It is important to be clear about the learning goals so that everyone is on the same page.
- Use a variety of teaching methods. There is no one-size-fits-all approach to teaching in a transdisciplinary Master's program. Instructors need to be flexible and use a variety of teaching methods to meet the needs of students from different disciplines.
- Encourage collaboration and teamwork. Students from different disciplines can learn from each other by collaborating on projects and assignments. Instructors should encourage collaboration and teamwork in the classroom.
- Be patient and understanding. Students from different disciplines may have different learning styles and needs. It is important to be patient and understanding with students as they learn new material and concepts.
- Be open to feedback. Instructors should be open to feedback from students. This feedback can help instructors to improve their teaching and create a more effective learning environment.

Here are some additional tips for effective class management in a transdisciplinary Master's program:

- Start the program by getting to know your students. This will help you to understand their backgrounds and learning styles.
- Be clear about your expectations for behavior and academic performance. Students need to know what is expected of them in order to be successful in the program.
- Be consistent in your enforcement of rules and procedures. This will help students to understand what is acceptable behavior and what is not.
- Be fair and impartial in your treatment of all students. This will help to create a positive learning environment where all students feel respected.

- Be proactive in preventing problems. This means monitoring student behavior, intervening early when problems start to arise, and teaching students how to solve problems on their own.
- Be willing to adapt your teaching style to meet the needs of your students. Not all students learn in the same way, so it is important to be flexible and willing to change your teaching style as needed.
- Seek help if you need it. If you are struggling with class management, don't be afraid to ask for help from your colleagues, supervisor, or a professional development program.

Effective class management in a transdisciplinary master's program is an ongoing process. It takes time, effort, and commitment to develop and maintain. However, it is one of the most important skills that instructors can learn. By following the tips above, instructors can create a positive learning environment where students from different disciplines can thrive.

Industry internship programme

Part of being an effective academician, is to support students in their thesis project and doing their industry-internship program. An industry-internship program for a transdisciplinary master's program is a program that allows students to gain hands-on experience in their chosen field by working with a company or organization. These programs can be a great way for students to learn about different aspects of their field, network with professionals, and gain valuable experience that can help them in their future careers.

There are many different industry-internship programs available for transdisciplinary master's programs. Some programs are specific to a particular field, while others are more general. Some programs are paid, while others are unpaid. The length of the program can vary as well.

To find an industry internship program, students can start by talking to their professors or advisors. They can also search online for programs that are specifically designed for transdisciplinary master students. When choosing a program, students should consider their interests, the requirements of their program, and the opportunities that the program offers.

Here are some of the benefits of participating in an industry-internship program for a transdisciplinary master's program:

- Gain hands-on experience in your chosen field
- Network with professionals
- Gain valuable experience that can help you in your future career
- Learn about different aspects of your field
- Make connections that can lead to a job after graduation
- Get a sense of what it is like to work in a particular industry
- Improve your resume and job prospects

The following are suggestions for us to motivate students and make them interested in steering their internship progress:

- Start planning early. Most programs start accepting applications in the fall or winter for the following summer.

- Let's motivate them to do their research. There are many different programs available, so it is important to choose an area of research that is a good fit for them.
- Be prepared to compete. There are usually many applicants for each program, so be prepared to compete for a spot.
- Be proactive. We need to inspire them to create opportunities by reaching out to companies and organizations that they are interested in working with.
- Be persistent. Students should not give up if they do not get their first choice. Keep applying for programs until they find one that is a good fit for them.

Industry-internship programs can be a great way to gain hands-on experience, network with professionals, and learn about different aspects of your field. It is a way to enhance your education and prepare for your future career.

Empowering Students with Design Thinking

Design thinking is a human-centered approach to problem-solving that can be used to teach master students to do research. It is an iterative process that involves understanding the problem, generating ideas, prototyping solutions, and testing them with users.

Here are some ways that design thinking can be used to teach master students to do research:

- **Empathize:** The first step in design thinking is to empathize with the people who are affected by the problem. This involves understanding their needs, wants, and pain points. Students can do this by conducting interviews, focus groups, and observations.
- **Define:** Once students have empathized with the people who are affected by the problem, they need to define the problem. This involves identifying the root cause of the problem and the specific needs that need to be addressed.
- **Ideate:** The next step is to generate ideas for solutions. This can be done through brainstorming, sketching, and prototyping. Students should be encouraged to come up with as many ideas as possible, even if they seem crazy.
- **Prototype:** Once students have generated some ideas, they need to prototype them. This involves creating a physical or digital representation of the solution. Prototyping helps students to test their ideas and get feedback from users.
- **Test:** The final step is to test the prototypes with users. This helps students to get feedback on the usability, feasibility, and desirability of the solution

By using design thinking, master students can learn to do research in a more human-centered way. They can learn to understand the needs of the people who are affected by the problem, generate creative solutions, and test them with users.

Here are some specific examples of how design thinking can be used to teach master students to do research in different disciplines:

- **In business:** Design thinking can be used to teach Masters students to conduct market research, develop new products and services, and improve customer satisfaction.
- **In engineering:** Design thinking can be used to teach Masters students to solve engineering problems, design new products and systems, and improve the user experience.

- In healthcare: Design thinking can be used to teach Masters students to improve patient care, develop new medical devices, and design more user-friendly healthcare systems.
- In education: Design thinking can be used to teach Masters students to improve teaching and learning, develop new educational tools and resources, and create more engaging and student-centered learning environments.
- In social sciences: Design thinking can be used to teach Masters students to solve social problems, develop new interventions, and improve the lives of people in need.

Design thinking is a powerful tool that can be used to teach master students to do research in a more creative and human-centered way. By using design thinking, students can learn to understand the needs of the people who are affected by the problem, generate creative solutions, and test them with users.

2 Teaching Materials of MSc FOODI

The FOODI consortium is a partnership of 16 academic institutions from 3 European countries (Greece, Italy, and Ireland) and 4 Asian countries (Malaysia, Thailand, and Cambodia). The following table depicts the FOODI consortium partners that pursue the program.

Institution Acronym	Institution name	Nation	M.Sc. Program Name	Material provided
UTM	Universiti Teknologi Malaysia	Malaysia		<ul style="list-style-type: none"> • Collection of teaching module sheets
UKL	Universiti Kuala Lumpur	Malaysia		<ul style="list-style-type: none"> • Teaching module sheet for the course of Food Science & Technology dedicated to students without food technology prerequisites. • Program structure • Collection of teaching module sheets
UiTM	Universiti Teknologi Mara	Malaysia	Food Science and Innovation	<ul style="list-style-type: none"> • Program structure, • Learning outcomes • Main rules
PSU	Prince of Songkla University	Thailand	Food Technology and Innovation	<ul style="list-style-type: none"> • Program structure, • Learning outcomes • Main rules • Syllabus (in Thai)
AIT	Asian Institute of Technology	Thailand	Food Innovation, Nutrition and Health	<ul style="list-style-type: none"> • Introduction and motivation • Program structure, • Learning outcomes • Main rules • Syllabus • Accreditation report
NUBB	National University of Battambang	Cambodia	Food Processing and Innovation	<ul style="list-style-type: none"> • Program structure, • Main rules • Syllabus • Accreditation report

ITC	Institute Technology Cambodia	Cambodia	Food Processing and Innovation	<ul style="list-style-type: none"> • Program structure, • Main rules • Syllabus • Accreditation report
SRU	Svay Rieng University	Cambodia	Food Processing and Innovation	<ul style="list-style-type: none"> • Program structure, • Main rules • Syllabus • Accreditation report
UHST	Universiti of Heng Samrin Thbongkhmum	Cambodia	Food Processing and Innovation	<ul style="list-style-type: none"> • Program structure, • Main rules • Syllabus • Accreditation report

3 Description of the provided material

In the following section, the material provided by each institution will be described in its contents.

3.1 Universiti Teknologi Malaysia

The material provided by Universiti Teknologi Malaysia consists of sheets used to describe teaching modules. In these sheets, the Master "Course" is referred to as the "Program," and the "teaching Modules" are referred to as "Courses".

The Azman Hashim International Business School has issued three module sheets, which include modules shared with the Master in Business Administration offered by the Azman Hashim International Business School. Each sheet begins with general module information such as the name, code, program, credit hours, and semester. It also includes a course synopsis and lecturer information, including names and contacts. The sheet then provides a map of correspondence between the "Course Learning Outcomes (CLO)" and the "Program Learning Outcome (PLO)." It also includes details on innovative "Teaching and Learning (T&L) Practice". The core of the sheet is the weekly schedule of the module, which outlines the delivery of different topics week by week. It specifies the hours dedicated to various activities such as lectures, training, practice, whether they are conducted in person, online, asynchronously, or through other modes. The sheet also provides details on continuous and final assessment modes. Additionally, it includes information on reference texts and additional details like academic honesty and plagiarism policies, as well as a disclaimer. The sheet concludes with the author and certifier information.

Other module sheets are jointly issued by the Azman Hashim International Business School (AHIBS) and the Faculty of Chemical and Energy Engineering (FCEE). Similar to the previous sheets, they include general module information, module synopsis, lecturer information, and a map of correspondence between the "Course Learning Outcomes (CLO)" and the "Program Learning Outcome (PLO)." The weekly schedule of the course is also provided. A separate table outlines how each specific "Course Learning Outcome" is addressed, including the hours dedicated to face-to-face activities (lectures, training, practice) and non-face-to-face student activities (guided learning and independent learning). The sheet also includes details on assessment modes, reference texts, additional information, and author and certifier details.

3.2 Universiti Kuala Lumpur

The material provided by Universiti Kuala Lumpur consists of a teaching module sheet for the course of Food Science & Technology dedicated to students without food technology prerequisites.; the program structure; the collection of teaching module sheets. In this material, the Master "Course" is referred to as the "Program," and the "teaching Modules" are referred to as "Courses".

The program structure is provided in the form of a table, organized in semesters, including the following information: the module code, the module name, the role of the course in the formation (University Requirement, Core; elective). The complete list of elective courses ends the table.

The module sheets are structured in the form of a table with 13 main items. Items 1 to 6 include: "course" name, code, classification (core or elective), teaching staff names, Semester and year, credit value, and prerequisites. Item 7 includes a list of "Course Learning Outcomes" (CLO) associated in parenthesis with a list of descriptors described in blue at the bottom of item 8. Before that, in item 8, the CLOs are related to the corresponding Program Learning Outcomes (PLO) in a table and associated with the teaching and assessment methods used. Item 9 reports the transferrable skills developed by the module attendance. Item 10 reports the Distribution of Student Learning Time (SLT), by specifying the hours dedicated to various activities such as lectures, training, and practice, indicating whether these are conducted in person, or online. The time dedicated to independent asynchronous learning is also reported with the total hours. In the same item 10, also the assessment methods are reported, in terms of Continuous and/or Final specifying the weight fraction of the different modes and if these are held in person, online or with independent asynchronous modes. Item 11 is dedicated to the description of any special structure requirement necessary to deliver the "course". Item 12 is for text references, and item 13 is for any other useful information.

3.3 Universiti Teknologi Mara

The material provided by Universiti Teknologi Mara for the local program named "M.Sc. in Food Science and Innovation" consists of the program structure. In these sheets, the Master "Course" is referred to as the "Program," and the "teaching Modules" are referred to as "Courses".

The program structure is provided in the form of a table, organized in semesters, including the following information: the module code, the module name, and the role of the course in the formation (core; elective). The document, then, provides the list of the Program Learning Outcomes (PLOs) and a table in which the PLOs are organized in terms of more general New Program Education Objectives (PEO) and are specified according to the main descriptors defined as Learning Outcome Domains (MQF) and the Learning Taxonomy.

Next, a table associate the "program courses" with the PLO-MQF and summarized the degree of support by course number to each PLO. The document summarizes the rules necessary to graduate and the entry requirements. A final table in the documents compares the master Course provided by UITM and the curriculum designed by the FOODI project.

3.4 Prince of Songkla University

The material provided by Prince of Songkla University for the local M.Sc. Food Technology and Innovation consists of the program structure. In these sheets, the Master "Course" is referred to as the "Program," and the "teaching Modules" are referred to as "Courses".

The program structure is provided in the form of a table, organized in semesters, including the following information: the module code, the module name, and the role of the course in the formation (core; elective). The complete list of elective courses ends the table. The document then provides the list of the Program Learning Outcomes (PLOs). The document summarizes the rules necessary to graduate. The whole syllabus available in the Thai language is provided in a further document.

3.5 Asian Institute of Technology

The material provided by the Asian Institute of Technology consists of the Introduction and motivation, Learning outcomes, Program structure, Main rules, and Syllabus of the modules.

The document provided includes the background and motivation to the institution of the Food Innovation, Nutrition and Health (FINH), the local version of the FOODI master course and the relevance of the educational proposal of FINH. Then, the program learning outcomes are provided, the career opportunities and the entry requirements. The yearly calendar of the program is described in the Curriculum section. The program structure is described in a table reporting the module and teaching activity codes, the semester, the credits awarded, the course type, the Instructor name and some remarks indicating whether the course is an existing one or if it is purposely activated for the program.

The syllabus of the modules ("course") is given in sheets, including a description of course objectives; a list of the learning outcomes; the course outline providing the main topics; the text references; the time distribution of the student load between different kind of activities (Lectures, and other activities); the description of the evaluation scheme and the name of the instructor.

An accreditation report is also provided, including all the steps necessary for the accreditation process describing the step, the step progress time, any issues or challenges associated with the step, the mitigation plan for the effects of these challenges, the state of the step and useful remarks. A final table in the documents compares the master Course provided by AIT and the curriculum designed by the FOODI project.

3.6 Cambodian Universities

National University of Battambang / Universiti of Heng Samrin Thbongkhmum / Svay Rieng University / Institute of Technology of Cambodia

The material provided by the Cambodian universities University consists of the Program structure, Main rules, Syllabus of the modules and the accreditation document. In this document, the Master "Course" is referred to as the "Program," and the "teaching Modules" are referred to as "Courses".

The program structure is described in a table reporting two curricula one consisting in a study and research and a second curriculum involving only research activities. Each curriculum is described in a table reporting Course Code, Course Names (both in Khmer and in English), and Credits. "Courses" are organized in different sections of the table in Core, Compulsory, Elective, Research and Research report. Graduation rules are reported in terms of credits dedicated to study of subjects and credits related to research.

The syllabus of the modules ("course") is given in sheets, including an initial table reporting Course Title, Course Code, Course Type (Core or Elective), Course Coordinator, and Credits. Five different sections (A to E) are given in the sheet. A) A course synopsis is provided in few lines. B) A table lists the main Course Learning

Outcomes. C) A table is included providing the different assessment methods adopted with the percentage contribution to the final evaluation. D) A Table describes the student workload in hours on the different possible activities Class Contact – Lectures, Class Contact - Small Group Discussions or online, Class Contact – Workshops, Specified learning activities, Blended learning activities, Autonomous student learning, Group-based learning, Assignment, Assessment (self-learning), Report, and Presentation. E) The final table organizes the module content, in Topics, their description and sources/references. The accreditation document in Khmer and its translation is also provided.

4 CONCLUSIONS

In a nutshell, the Teaching and Training Materials for MSc FOODI highlights the importance of the program in addressing the challenges facing the food industry in the 21st century. The program is designed to train a new generation of food industrialists, scientists and other related talents who aspire in becoming problem solvers and innovators within the food innovation value chain.

We emphasize the importance of endeavouring innovative teaching and learning methodologies as a transdisciplinary academic program strives for a collective intelligence from different disciplines, such as food science, engineering, economics, and social sciences, to work together on solving complex food problems. This transdisciplinary approach is essential for developing innovative solutions that address the root causes of food challenges.

From a broad perspective, we are calling for the continued development of training programs for instructors and learners in a transdisciplinary academic program like the MSc FOODI. In thinking forward, we suggest the following:

- Continue to emphasize the importance of transdisciplinary research. The FOODI consortium is a model for how food scientists, engineers, economists, and social scientists can work together to solve complex food problems. The teaching and training materials should continue to emphasize the importance of this approach.
- Incorporate more hands-on learning experiences. Facilitators and instructors could develop cross-discipline workshops which spur the development of more innovative teaching and learning methods. These methods should be incorporated into the Teaching and Training Materials to give students the opportunity to gain practical experience in food science and engineering.
- Make the materials more accessible to students from different backgrounds. The FOODI consortium has made the Teaching and Training Materials available online. This is a great way to make the materials more accessible to students from different backgrounds. However, the materials could be made even more accessible by providing translations into other languages.
- Continue to update the materials to reflect the latest research. The food industry is constantly evolving, and so too must the Teaching and Training Materials. The materials should be updated on a regular basis to reflect the latest research in transdisciplinary perspectives.