CENTRAL TEACHING INNOVATION FUND

FINAL REPORT

EMPOWERING STUDENTS IN FOOD MATERIAL CHARACTERISTICS THROUGH XMIND-BASED LEARNING

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Academic Development Center

2024/2025

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A. Title Page

Title of Proposal	:	Empowering Students in Food Material Characteristics Through XMind-Based Learning
Name of Course	:	Food Material Characteristics
Representative	:	Abdullah Muzi Marpaung
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Mobile phone	:	08111876800
Duration of CTIF Program	:	6 month

The Prominence Office Tower, Tangerang

Date: 26 May 2025

Course Representative	Head of Program Study	Dean of Faculty
	Signature 	**Signature** 
Dr. Ir. Abdullah Muzi Marpaung	**Della Rahmawati, S.Si, M.Si, PhD**	**Dr. Hery Sutanto, S.Si., M.Si.**
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1. PROJECT SUMMARY

This project aimed to improve student engagement and conceptual understanding in the Food Material Characteristics course by integrating XMind, a digital mind mapping tool. The innovation focused on helping students visually organize complex concepts such as food components, their interactions, and their roles in food structure and processing..

2. TEACHING INNOVATION IMPLEMENTATION

2.1 Project Activities

The project was implemented in the Food Material Characteristics course, involving 6 students from Semester 4 of the Food Technology program.

Below is the timeline of key activities:

- 19 February 2025
  - Students were instructed to download the free version of XMind (Version 22.11.3771) to begin familiarizing themselves with the software.
- 20 February 2025
  - An introductory session was conducted to demonstrate the basic functions of XMind. Students received their first assignment to apply the tool in organizing lecture content.
- Week 3–13
  - Weekly monitoring was conducted. Students were required to update and submit their XMind files each week, reflecting the topic covered in class. Feedback was provided regularly to improve both content accuracy and visual structure.
- 6 March 2025
  - Students received the official guideline for the final project:
  - "Food Material Characteristics – Semester Summary Using XMind", which served as a capstone task to integrate all topics covered throughout the semester.
- 29 April 2025
  - A workshop for lecturers was conducted to share the innovation, demonstrate teaching applications of XMind, and encourage cross-course adoption within the department.
- 26 May 2025
  - Final report submission

2.2 Challenges & Solutions

The use of XMind in class ran smoothly, as the software was easy for students to learn and use.

The only challenge was the low attendance at the lecturer workshop due to scheduling conflicts.

To address this, a follow-up workshop is planned during a less busy period, such as the break between semesters.

3. OUTCOMES

The implementation of XMind was monitored weekly through student submissions. The final assignment, *"Food Material Characteristics – Semester Summary Using XMind"*, will be submitted in early June 2025, so full evaluation is not yet available.
Planned outcome metrics include:

- Digital adoption, based on consistent use of XMind.
- Student understanding, assessed through the quality of final mind maps.

The results will be used to refine and improve future implementation.

4. BUDGET REALIZATION *(if applicable)*

- No budget was used. The project was fully implemented using free tools and existing resources..

5. SEMESTER LEARNING PLAN

- SLP (Semester Learning Plan) should be attached to the final report
- Find the SLP Template **HERE** **(THIS SLP TEMPLATE IS FOR CTIF REPORT USE ONLY)**

Appendices

Please attach supporting data or documents if necessary

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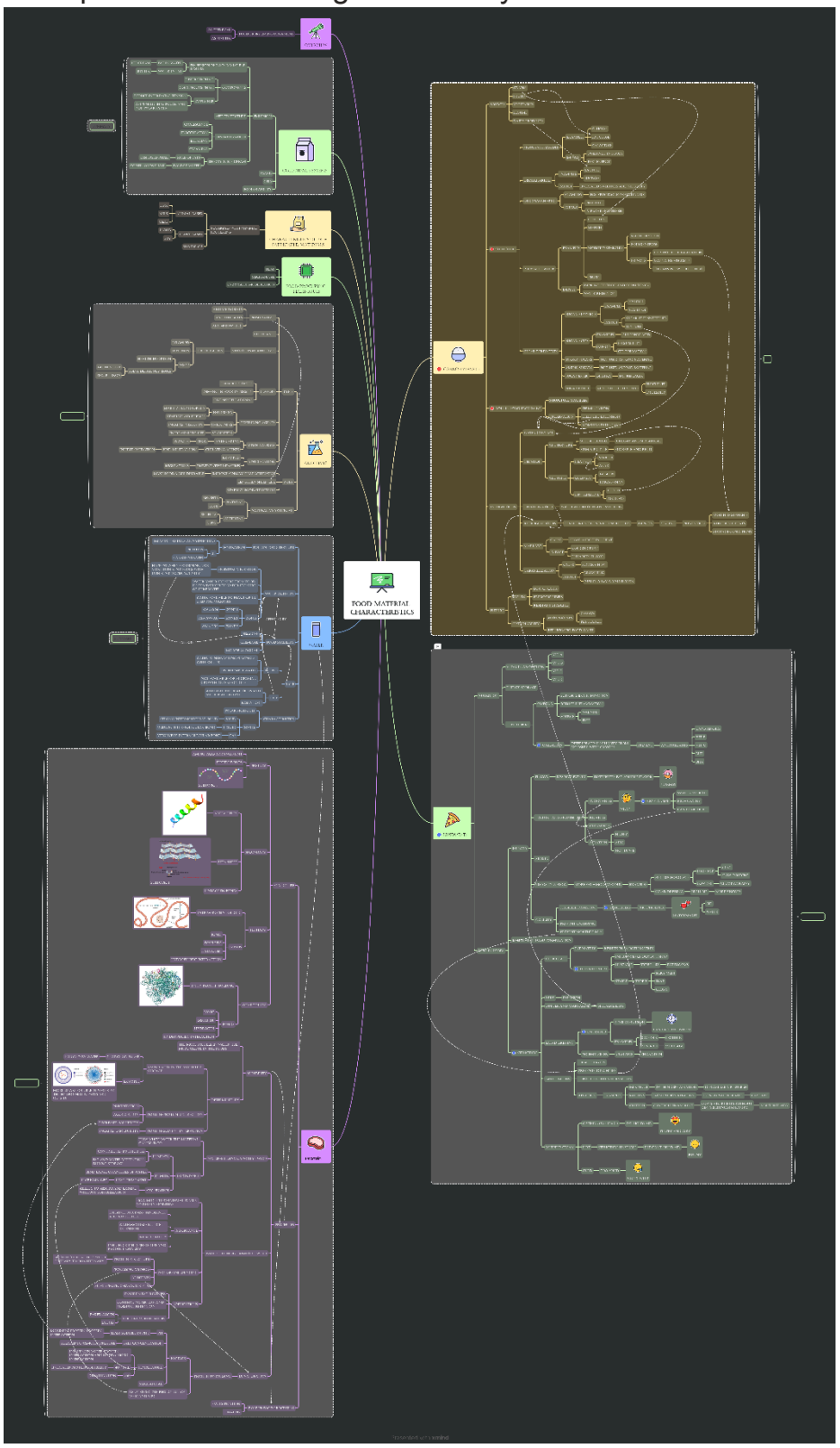
Example of XMIND File generated by a student



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SEMESTER LEARNING PLAN
(RENCANA PEMBELAJARAN SEMESTER)
No. Doc: SLP/FT/ D615-1FTLA

Course Name : **Food Material Characteristics**
Course Code : **D615-1FTLA**
Credit : **2 SKS/ 3 ECTS**
Semester : **4**
Course Status : **Mandatory**
Prerequisite/s : **-**
Faculty : **Life Sciences & Technology**
Study Program : **Food Technology**
Concentration : **-**
Degree : **Bachelor**
Instructor(s) : **Abdullah Muzi Marpaung & Maria DPT Gunawan Puteri**
Delivery Mode : **Hybrid**
Learning Method : **Blended Learning**
Total Activity Time[1] : **90 hours**
Scheduled Session[2] : **60 hours**
Independent Study : **30 hours**

Course Description	This subject provides an overview of the characteristics of different food materials and their importance in food processing, structure, properties, and performance. Students will learn about the physical, chemical, biological, and sensory properties of carbohydrates, proteins, lipids, water, colors, flavors, and additives, and their roles in food

[1] 1 credit equals to 45 hours of learning activities (including guided, structured assignment, & independent study) per semester
[2] total sessions x total SKS x 50 minutes

	processing, structure, and functionality. The subject will also cover different food processing techniques and their effects on food materials, as well as how to use food materials, processing techniques, and other factors to create new and improved food products with better taste, appearance, and nutritional value. Through this subject, students will gain a deeper understanding of the relationship between food material characteristics and food architecture, and how to apply this knowledge in food product development.
Learning Outcomes	***Graduate Learning Outcomes (CPL) assigned to this course**
	CPL 1: CPL 2: CPL 3:
	***Course Learning Outcomes (CPMK)**
	1.Understand the roles of carbohydrates, proteins, lipids, water, and additives in food processing and how they contribute to food structure, properties, and performance. 2.Analyze the impact of different food processing techniques on food structure, properties, and performance. 3.Understand the characteristics of prefabricated materials and their impact on food processing, structure, properties, and performance. 4.Develop critical thinking skills to analyze and interpret data related to food material characteristics and their impact on food quality and safety. 5.Apply knowledge of food material characteristics to real-world situations, such as food processing and product development, to make informed decisions and solve problems.
	***Planned Final Ability (Sub-CPMK, if any)**
	Sub-CPMK X: ..... Sub-CPMK X: ..... Sub-CPMK X: .....
References	**Primary Reference:**

	Additional Reference:

Session	Topic/ Subtopics	Learning Outcomes	Assessment Criteria		Student Learning Experiences/Activities	Learning Methods and Modalities	Allocation Time		Learning Materials
			Indicator	Weight (%)			Scheduled (@50 Min)	Independent Study (@Hours)	
1	**Introduction to Food Material Characteristics** • Overview of the importance of understanding the characteristics of different food materials in food processing, structures, properties, and performances	CPMK 1	In-Video-Quiz(Formative)		Attend course introduction; explore syllabus and learning flow; follow in-class XMind tutorial	TCL Lecture, Synchronous TCL Flipped Classroom, Mind Mapping, Synchronous	2 4	1.5 4	Syllabus PDF, Intro Slides GSlides, XMind Tutorial Video PDF/GSlides: Carbohydrates, Video: Carbs 1.mp4, In-Video-Question Carbs 2.mp4
2-3	**Carbohydrates** • Role of carbohydrates in food	CPMK 1, CPMK 4, CPMK 5	• Ability to classify different types of carbohydrates based on their	5%	Watch video lecture on carbohydrates; complete in-video quiz; build carbohydrate branch in XMind	TCL Flipped Classroom, Mind Mapping, Synchronous	4	4	PDF/GSlides: Proteins, Video: Proteins 1.mp4, GCR Quiz Assignment: Protein Structure Quiz

	processing (thickening, gelling, emulsifying, and sweetening) • Contribution of carbohydrates to food structure (gel, emulsion, and aerated structures) • Impact of carbohydrates on food properties (viscosity, solubility, stability, and nutritional properties) Influence of carbohydrates on food performance (texture, nutritional properties)		structures and properties. • Ability to explain the role of carbohydrates in food processing and their contributions to food structure, properties, and performance. • Ability to compare and contrast the impact of different carbohydrates on food texture, viscosity, stability, and nutritional properties • Quiz 1 Assessment in G-classroom						
4-5	**Proteins** • Role of proteins in food processin	CPMK 1, CPMK 4, CPMK 5	• Ability to classify different types of proteins based on	5%	Join live protein lecture; analyze protein properties; update XMind with structure	TCL Flipped Classroom, Mind Mapping, Synchronous	4	3	PDF/GSlides: Lipids, Video: Lipids 1.mp4, In-Video-Question: Lipids Emulsion.mp4

	g (emulsifying, thickening, gelling, and foaming) • Contribution of proteins to food structure (strength, elasticity, and stability) • Impact of proteins on food properties (texture, viscosity, stability, and nutritional properties) Influence of proteins on food performance (emulsifying, thickening, gelling, foaming, and nutritional properties)		their structures and properties • Ability to explain the role of proteins in food processing and their contributions to food structure, properties, and performance • Ability to compare and contrast the impact of different proteins on food texture, viscosity, stability, and nutritional properties • Quiz 2 Assessment in G-classroom		and function examples •				
6-7	**Lipids (Fats)** • Role of lipids in food processing (emulsifyi	CPMK 1, CPMK 4, CPMK 5	• Ability to classify different types of lipids based on their structures	5%	• Study lipid-related content; join discussion on emulsions; revise XMind map with lipid concepts	TCL Assessment, Synchronous	2	2.5	Midterm Exam Paper, Reflection Worksheet PDF

	ng, flavoring, and texturing) • Contribution of lipids to food structure (emulsion, aerated structures, and texture) • Impact of lipids on food properties (texture, viscosity, stability, and nutritional properties) Influence of lipids on food performance (emulsifying, flavoring, texturing, shelf life		and properties • Ability to explain the role of lipids in food processing and their contributions to food structure, properties, and performance • Ability to compare and contrast the impact of different lipids on food texture, viscosity, stability, and nutritional properties • Quiz 3 Assessment in G classroom						
8				15%	• Sit for mid-semester exam; reflect on map progress; continue independent updates to XMind	TCL Lecture, Mind Mapping, Synchronous	4	4	PDF/GSlides: Water, Case Reading PDF: Water Activity, In-Video-Question: Food Moisture.mp4

9-10	**Water** • Role of water in food processing (mixing, blending, cooking, and preservation) • Contribution of water to food structure (moisture content and hydration) • Impact of water on food properties (texture, viscosity, and stability) Influence of water on food performance (cooking, preservation, and texture)	CPMK 1, CPMK 4, CPMK 5	• Ability to explain the role of water in food processing and their contributions to food structure, properties, and performance • Ability to compare and contrast the impact of different water levels on food texture, viscosity, and stability • Assessment in • G-classroom Quiz 4	5%	• Investigate water properties in foods; participate in group discussion; map water activity and effects	TCL Flipped Classroom, Collaborative Mapping	4	3	PDF/GSlides: Additives, Video: Additives.mp4, Collaborative Mapping Template (XMind)
11-12	**Colors, Flavors, and Additives** • Role of Colors, Flavors, and Additives	CPMK 1, CPMK 4, CPMK 5	• Ability to classify different types of colors, flavors, and additives based on	5%	• Analyze roles of colors, flavors, and additives; collaborate on mapping sensory properties	TCL Project-Based Learning, Asynchronous + Synchronous	4	4	PDF: Prefabricated Materials (Eggs, Milk, Flour), Video: Ingredients.mp4, XMind Final Template

	in food processing • Contribution of Colors, Flavors, and Additives to food structure • Impact of Colors, Flavors, and Additives on food properties Influence of Colors, Flavors, and Additives on food performance		their structures and properties • Ability to explain the role of colors, flavors, and additives in food processing and their contributions to food structure, properties, and performance • Ability to compare and contrast the impact of different colors, flavors, and additives on food texture, viscosity, stability, and nutritional properties • Quiz 5 Assessment in G-classroom						

Notes:
[Please Add Notes]

Prepared by:	Reviewed by:	Approved by:
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Head of Editorial Team	Head of Dept of Food Technology……	Dean of Faculty of LST……..