SYLLABUS

REGARDING THE QUALIFICATION CYCLE FROM 2024/2025 TO 2027/2028

ACADEMIC YEAR 2026/2027

1. BASIC COURSE/MODULE INFORMATION

Course/Module title	**Fermentation processes in fruit, vegetable and mushroom processing**
Course/Module code *	
Faculty (name of the unit offering the field of study)	Faculty of Technology and Life Sciences
Name of the unit running the course	Department of General Food Technology and Human Nutrition
Field of study	Food and human nutrition technology
Qualification level	First stage
Profile	general academic
Study mode	stationary
Year and semester of studies	year III, semester 6
Course type	specialty/ Fermentation processes in food production
Language of instruction	english
Coordinator	dr inż. Tomasz Cebulak
Course instructor	dr inż. Tomasz Cebulak, dr inż. Zuzanna Posadzka, dr inż. Natalia Żurek

* - as agreed at the faculty

1.1.Learning format – number of hours and ECTS credits

Semester (no.)	Lectures	Classes	Colloquia	Lab classes	Seminars	Practical classes	Internships	others	**ECTS credits**
6	15			30					3

1.2. Course delivery methods

☒ - conducted in a traditional way

- involving distance education methods and techniques

1.3. Course/Module assessment (exam, pass with a grade, pass without a grade)
pass without a grade

2.PREREQUISITES

Subjects: Food Microbiology, Quality Assessment of Raw Materials and Plant Products, General Technology and Preservation of Food

3. OBJECTIVES, LEARNING OUTCOMES, COURSE CONTENT, AND INSTRUCTIONAL METHODS

3.1. Course/Module objectives

O1	Familiarizing students with the latest trends in fruit, vegetable and mushroom fermentation technology
O2	Improvement of proper behaviors in the field of production hygiene and the functioning of the HACCP system in the production of fermented fruit and vegetable products and mushrooms
O3	Providing knowledge on the use of fruit and vegetable raw materials and mushrooms in fermentation processes
O4	Preparing students to use current fruit, vegetable and mushroom fermentation technologies.
O5	Preparing students for independent and creative problem solving in the technology of fermentation of fruits, vegetables and mushrooms

3.2 COURSE/MODULE LEARNING OUTCOMES

Learning Outcome	The description of the learning outcome defined for the course/module	Relation to the degree programme outcomes
LO_01	knows at an advanced level the technologies and machinery used in the technologies of fruit, vegetable and mushroom fermentation	K_W11
LO_02	is able to analyse the impact of available technologies for fermentation of fruits, vegetables and fungi on the burden of the natural environment, as well as human health	K_U07
LO_03	is able to solve technological and engineering tasks and make the right decisions related to the use of appropriate fermentation technologies, fruits, vegetables and mushrooms in connection with the applicable food law regulations	K_U09
LO_04	has a conscious need to maintain the tradition and care for the ethics of the profession of a food and nutrition technologist	K_K05

3.3 Course content

A. Lectures

Content outline
Substantive content
Tradition and history of production and consumption of fermented plant products

Health aspects of fermented foods
Issues of hygiene of fermentation processes
Technological equipment of plants producing fermented preparations from fruit, vegetables and mushrooms
Technologies for the production of fermented foods from Asia and Africa
Methods and models of controlling the fermentation of fruits, brews and mushrooms
Microbial fermentation and its role in improving fermented foods
Packaging and shelf life protection of fermented plant products
Plant-based alternatives to yogurt: prospects for new biotechnological challenges
Lactic acid fermentation of edible mushrooms: tradition and technology.
Analysis and Critical Control Point (HACCP) and its application to fermented foods

B. Laboratory classes

Content outline
Familiarizing students with the principles of credit, learning outcomes, health and safety and laboratory equipment
Technology for the production of fruit and vegetable vinegars
Technology for the production of sauerkraut
Production technology for pickled cucumbers and other native vegetables
Cider production technology
Technology for the production of mushroom sourdough
Technology for the production of fermented acidic tonic drinks
Technology for the production of fermented vegetable juices
Technology for the production of fermented legume products
Kvass production technology

3.4 Methods of Instruction

Lecture supported by a multimedia presentation.
Laboratory classes: group work - accounting tasks, discussion, work in a laboratory, carrying out experiments, designing methods.

4. Assessment techniques and criteria

4.1 Methods of evaluating learning outcomes

Learning outcome	Methods of assessment of learning outcomes (e.g. test, oral exam, written exam, project, report, observation during classes)	Learning format (lectures, classes, ...)
LO-01	written test, 2 tests reports from laboratory exercises	Lectures, classes
LO-02	Report from laboratory exercises, observations during classes, 2 colloquia	Exercise
LO_03	Report from laboratory exercises, observations during classes, 2 colloquia	Exercise
LO_04	Observations during classes	Exercise

4.2 Course assessment criteria

Completion of all learning outcomes. Grade of more than 55% of the material, grade plus of more than 65% of the material, grade of good above 75%, grade of good plus above 85% of the material, grade very good above 95% of the material

5. Total student workload needed to achieve the intended learning outcomes – number of hours and ECTS credits

Activity	Number of hours
Scheduled course contact hours	**45/1,8**
Other contact hours involving the teacher (consultation hours, examinations)	participation in consultations – 5/0,2 participation in the exam -2 /0,08
Non-contact hours - student's own work (preparation for classes or examinations, projects, etc.)	preparation for classes – 12/0,48 preparation for tests – 11/0,44
Total number of hours	**75**
Total number of ECTS credits	**3**

* One ECTS point corresponds to 25-30 hours of total student workload

6. Internships related to the course/module

Number of hours	
Internship regulations and procedures	

7. Instructional materials

Compulsory literature: 1. Praca zbiorowa pod redakcją Bednarski W., Repsa A. Biotechnologia żywności. PWN Warszawa 2021 2. Adamczyk M., Bednarski W., Fiedurek J. Podstawy biotechnologii przemysłowej. PWN Warszawa 2017 3. Bednarski W., Pietkiewicz J. J. Biotechnologia żywności dla dietetyków. Aspekty technologiczne i żywieniowe. Wydawnictwo Państwowej Wyższej Szkoły Zawodowej im. Witelona w Legnicy. Legnica 2018 4.Libudzisz Z., Kowal K., Żakowska Z. Mikrobiologia techniczna tom 2. Mikroorganizmy w biotechnologii, ochronie środowiska i produkcji żywności. PWN 2020 Warszawa
Complementary literature: 1. Katz S. E. Sztuka fermentacji. Wydawnictwo Kobiece. 2021 2. Przemysł fermentacyjny i owocowo-warzywny. Czasopismo branżowe. Frias J., Martinez-Villaluenga., Penas E. Fermented Foods In Health and Disease Prevention. ELSELVIRE PRESS 2017.

Approved by the Head of the Department or an authorised person