SYLLABUS

REGARDING THE QUALIFICATION CYCLE FROM 2022/2023 TO 2022/2023

1. BASIC COURSE/MODULE INFORMATION

Course/Module title	Fermentation processes
Course/Module code *	
Faculty (name of the unit offering the field of study)	College of Natural Sciences Institute of Food and Nutrition Technology
Name of the unit running the course	Department of Bioenergetics, Food Analysis and Microbiology
Field of study	Food technology and human nutrition
Qualification level	
Profile	General academic
Study mode	Part-time
Year and semester of studies	Winter semester
Course type	Erasmus + program
Language of instruction	English
Coordinator	Maciej Kluz PhD
Course instructor	Maciej Kluz PhD

* - 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**
Winter	15			15					5

1.2. Course delivery methods

- conducted in a traditional way

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

EXAM

2. PREREQUISITES

Completed course: general and inorganic chemistry, organic chemistry, food microbiology, biochemistry

3. Objectives, Learning Outcomes, Course Content, and Instructional Methods

3.1. Course/Module objectives

O1	Discuss the characteristics and role of microorganisms in fermentation processes.
O_2	Discuss the mechanisms of fermentation processes in the food industry.

3.2. Course/Module Learning Outcomes (to be completed by the coordinator)

Learning Outcome	The description of the learning outcome defined for the course/module	Relation to the degree programme outcomes
LO_01	Has knowledge of the mechanisms of fermentation processes involving micro-organisms.	K_W02
LO_02	Has knowledge of the principles of safe production of food obtained from fermentation processes using microorganisms.	K_W09
LO_03	Be able to analyse the ethical aspects a rising from the use of micro-organisms in fermentation processes.	K_U07
LO_04	Understands and cares about the work ethic of the food technologist profession.	K_K04

3.3. Course content (to be completed by the coordinator)

A. Lectures

Content outline
General characteristics of microorganisms. Metabolism of micro-organisms.
Microorganisms in alcoholic fermentation.
Microorganisms in lactic fermentation.
Microorganisms in acetic fermentation.
Microorganisms in lemon fermentation.
Microorganisms in butter fermentation.
Directions for improving the technological characteristics of industrial microbial cultures.

B. Classes, tutorials/seminars, colloquia, laboratories, practical classes

Content outline
Getting to know health and safety rules in the workshop. Organizational activities.
Principles of microbial culture.
Carrying out acetic fermentation. Production of fruit vinegars.
Analysis of the fruit vinegars obtained.
Microbiological analysis of fermented vegetable products.
Final work.

3.4. Methods of Instruction

Lecture with multimedia presentation.
Laboratory: performing experiments, designing experiments, working in groups.

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	Colloquium, written assessment, exam	Lectures, Lab
LO-02	Colloquium, written assessment, exam	Lectures, Lab
LO-03	Colloquium, written assessment, exam	Lectures, Lab
LO-04	Colloquium, written assessment, exam	Lectures, Lab

4.2 Course assessment criteria

A prerequisite for passing a course is the achievement of all the assumed learning outcomes. A positive grade in the course is determined by the number of points obtained in examinations (>50% of the maximum number of points):): 2,0 (f); 50 % <; 3,0 (e) 51 - 65%; 3,5 (d); 66 - 75%, 4,0 (c); 76 - 85%, 4,5 (b); 86 - 92%; 5,0 (a) 93-100%.

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	30

Other contact hours involving the teacher (consultation hours, examinations)	20
Non-contact hours - student's own work (preparation for classes or examinations, projects, etc.)	75
Total number of hours	125
Total number of ECTS credits	5

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

6. Internships related to the course/module

Number of hours	0
Internship regulations and procedures	0

7. Instructional materials

Compulsory literature: 1.Theory and Design of Fermentation Processes, Dionisi Davide, 2021, CRC Press, ISBN9781032108322 2. Principles of Fermentation Technology, Larsen and Keller Education, 2022, ISBN: 1641726768 3. Advances in Microbial Fermentation Processes, Maria Tufariello, Francesco Grieco, 2022, ISBN 978-3-0365-4009-2 (Hbk); ISBN 978-3-0365-4010-8 (PDF) https://doi.org/10.3390/books978-3-0365-4010-8
Complementary literature: Kluz Maciej Ireneusz, Pietrzyk Karol, Pastuszczak Miłosz, Kačániová Miroslava, Kita Agnieszka, Kapusta Ireneusz, Zaguła Grzegorz, Zagrobelna Edyta, Struś Katarzyna, Marciniak-Łukasiak Katarzyna, Stanek-Tarkowska Jadwiga, Timar Adrian Vasile, Puchalski Czesław, Microbiological and Physicochemical Composition of Various Types of Homemade Kombucha Beverages Using Alternative Kinds of Sugars, Foods, 2022 : Vol. 11, iss. 10, id. art. 1523 p-ISSN: 2304-8158

Approved by the Head of the Department or an authorised person