**SYLLABUS**

**regarding the qualification cycle FROM 2023 To 2024**

1. Basic Course/Module Information

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| --- | --- |
| Course/Module title | Analitycal Methods in Food Production |
| Course/Module code \* |  |
| Faculty (name of the unit offering the field of study) | Institute of Food Technology and Nutrition, College of Natural Sciences |
| Name of the unit running the course | Department of Bioenergetics, Food Analyses and Microbiology |
| Field of study | Food Technology And Human Nutrition |
| Qualification level | I degree |
| Profile | *academic* |
| Study mode | *Full-time* |
| Year and semester of studies | *2nd year, 3rd semester* |
| Course type | *Lecture and laboratory classes* |
| Language of instruction | English |
| Coordinator | dr hab. inż. Grzegorz Zaguła, prof. UR |
| Course instructor | dr hab. inż. Grzegorz Zaguła, prof. UR |

\* - as agreed at the faculty

1.1.Learning format – number of hours and ECTS credits

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Semester  (n0.) | Lectures | Classes | Colloquia | Lab classes | Seminars | Practical classes | Internships | others | **ECTS credits** |
| 3 |  | 30 |  |  |  |  |  | Reports of conducted experiments | 5 |

1.2. Course delivery methods

- conducted in a traditional way as laboratory classes

- involving distance education methods and techniques

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

pass with a grade

2. Prerequisites

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| Knowledge of general, organic and inorganic chemistry, physics and mathematical statistics, instrumental analysis / physicochemical methods in food analysis. |

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

3.1. Course/Module objectives

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| --- | --- |
| O1 | To familiarize students with the issues of instrumental food analysis. |
| O2 | Acquisition by students of the ability to select analytical methods to determine the quality of various raw materials and food products. |

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 | Students knows standards relevant for sampling and standards describing analytical procedures |  |
| LO\_02 | Is able to choose a research method for a task in food technology, interpret results and draw conclusions |  |
| LO\_03 | Is able to perform basic food analysis using the available equipment |  |
| LO\_04 | Can interact and work in a group, taking on different roles in it |  |

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

1. Lectures

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| Content outline |
| Methods used in the analysis and evaluation of food quality. |
| Criteria for the selection and evaluation of the analytical method |
| Rules for collecting and preparing samples for analytical tests |
| Types of samples (definitions), number of samples. |
| Methods for preparing an average laboratory sample. |
| Stages of the analytical process. |

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

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| --- |
| Content outline |
| Preparation for trace analysis of environmental samples |
| The method of adding a standard to verify matrix effects |
| A method of analytical work using an internal standard to eliminate interference effects |
| Application of Certified Reference Materials in trace analysis |
| Determination of detection limits and measurement uncertainties in trace analysis |
| Verification of determination methods in trace analytics |

3.4. Methods of Instruction

e.g.

*Lecture: a problem-solving lecture/*

*Laboratory classes: designing and conducting experiments*

4. Assessment techniques and criteria

Lecture: problem lecture, lecture with multimedia presentation

Exercises: group work, discussion

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 | Report of experiment, observation during classes | lECTURE, cLASSES |
| LO\_02 | Report of experiment, observation during classes | lECTURE, cLASSES |
| LO\_03 | Report of experiment, observation during classes | lECTURE, CLASSES |
| LO\_04 | observation during classes | lECTURE, CLASSES |

4.2 Course assessment criteria

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| grade 3.0 51-65%, grade 3.5 66-75%, grade 4.0 76-85%, grade 4.5 86-95%, grade 5.0 96-100% |

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) | 35 |
| Non-contact hours - student's own work (preparation for classes or examinations, projects, etc.) | 60 |
| 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 |  |
| Internship regulations and procedures |  |

7. Instructional materials

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| Compulsory literature:  Structured Analytic Techniques for Intelligence Analysis Autorzy Richards J. Heuer Jr., Richards J. Heuer, Randolph H. Pherson |
| Complementary literature:  Chosen scientific papers |

Approved by the Head of the Department or an authorised person