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| **Course title:** | Biofilm in food technology |
| **Course title in Polish:** | Biofilm w technologii żywności |
| **Course for discipline:** | food technology and nutrition |

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| **Semester:** | 3 | **Status of course:** | faculty | **Language:** | english |
| **Academic year:** | | **Catalog number:** | | | |

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| **Coordinator of course:** | dr hab. Monika Trząskowska, prof. SGGW |
| **Lecturer od course:** | dr hab. Monika Trząskowska, prof. SGGW |
| **Executing unit:** | Department Food Gastronomy and Food Hygiene |
| **Ordering unit:** | Doctoral School SGGW |
| **Assumptions, goals and description of the course:** | The aim of the course is to provide knowledge and skills regarding:<br>(1) definitions, places of occurrence and conditions of biofilm formation, which are formed by microorganisms present in the food production chain;<br>(2) Characteristics of biofilms formed on the working surfaces of machines and devices and on food products;<br>(3) Characterization and risk analyzes associated with the formation of the above-mentioned biofilms;<br>(4) biofilm identification and assessment methods;<br>(5) preventive actions and biofilm removal methods.<br>During classes, students will formulate a research problem and search for data that will be analyzed and discussed. |
| **Didactic form, number of hours:** | Class, 10h |
| **Teaching methods:** | Searching and analyzing data available in the public domain, discussing, formulating conclusions, and writing an expert opinion, presenting the results. Use of systematic review methodology and/or expert knowledge elicitation (EKE). |
| **Limit of people in the group:** | 12 |

**Learning outcomes**

| **KNOWLEDGE - the graduate knows and understands:** | **SKILLS - the graduate is able to:** | **COMPETENCES - the graduate is ready to:** |
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| To the extent enabling to revise the existing pradigms in the field/discipline - the world achievments, gathering theoretical background as well as general and selected detailed issues | Carry out critical assessment of the scientific research findings and expert activities and their contribution to the knowledge development in the field/discipline | Critically evaluate the achievments in the field/discipline represented |
| Major general development trends in the field/discipline | | Recognise knowledge in solving cognitive and practical problems characteristic for the area of research (field/discipline) and in an interdisciplinary aspect |
| | | Support the ethos of scientific circles and conduct independent research |

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| **The method of verification of learning outcomes:** | Assessment of work during classes, project assessment. |
| **Form of documentation of achieved learning outcomes:** | Assessment report for tasks performed during classes, project documentation. |
| **Elements and weights of the final grade:** | Final grade: reports on tasks performed during the exercise - 30%, project evaluation (documentation) - 40%, exam - 30%. |
| **Place of the course:** | Didactic class |

**Basic and supplementary literature**


Basic literature:
1. Pometto, Anthony L., i Ali Demirci, red. 2015. Biofilms in the Food Environment. II. Chicago: John Wiley & Sons, Ltd.
2. Ximenes, Eduardo, Lori Hoagland, Seockmo Ku, Xuan Li, i Michael Ladisch. 2017. „Human Pathogens in Plant Biofilms: Formation, Physiology, and Detection". Biotechnology and Bioengineering 114 (7): 1403–18. https://doi.org/10.1002/bit.26247.
Supplementary literature:
1. Čabarkapa, Ivana, Radmilo Čolović, Olivera Đuragić, Sanja Popović, Bojana Kokić, Dubravka Milanov, i Lato Pezo. 2019. „Anti-biofilm activities of essential oils rich in carvacrol and thymol against Salmonella Enteritidis". Biofouling 35 (3): 361–75. https://doi.org/10.1080/08927014.2019.1610169.
2. Møretrø, Trond, Helge Fanebust, Annette Fagerlund, i Solveig Langsrud. 2019. „Whole room disinfection with hydrogen peroxide mist to control Listeria monocytogenes in food industry related environments". International Journal of Food Microbiology 292 (marzec): 118–25. https://doi.org/10.1016/j.ijfoodmicro.2018.12.015.
3. Trmcic, Aljosa, Huihui Chen, Monika Trząskowska, Sandeep Tamber, i Siyun Wang. 2018. „Biofilm-Forming Capacity of Five Salmonella Strains and Their Fate on Postharvest Mini Cucumbers". Journal of Food Protection 81 (11): 1871–79. https://doi.org/10.4315/0362-028X.JFP-18-180.


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| **Comments:** | |

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| **Estimated number of hours of work of the doctoral student necessary to achieve the assumed learning outcomes:** | 15 |

| **Leraning outcomes reference to the second degree characteristics of the National Qualification Framework (level 8) covering doctoral competences:** | | |
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| **Symbol:** | **Learning outcomes:** | **8 level NQF** |
| SD1_KW01 | To the extent enabling to revise the existing pradigms in the field/discipline - the world achievments, gathering theoretical background as well as general and selected detailed issues | P8S_WG |
| SD1_KW02 | Major general development trends in the field/discipline | P8S_WG |

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| SD1_KU05 | Carry out critical assessment of the scientific research findings and expert activities and their contribution to the knowledge development in the field/discipline | P8S_UW |
| SD1_KK01 | Critically evaluate the achievments in the field/discipline represented | P8S_KK |
| SD1_KK03 | Recognise knowledge in solving cognitive and practical problems characteristic for the area of research (field/discipline) and in an interdisciplinary aspect | P8S_KK |
| SD1_KK08 | Support the ethos of scientific circles and conduct independent research | P8S_KR |