Course title:	Cellular nitro-oxidative stress
Course title in Polish:	Komórkowy stres nitrooksydacyjny
Course for discipline:	biological sciences, agriculture and horticulture, veterinary science

Semester:	6	**Status of course:**	faculty	**Language:**	english
Academic year:	2027/28	**Catalog number:**	78/2025/26		

Coordinator of course:	dr hab. Urszula Krasuska, prof. SGGW
Lecturer od course:	dr hab. Urszula Krasuska, prof. SGGW
Executing unit:	Institut of Biology, Departmnt of Botany and Plant Physiology
Ordering unit:	Doctoral School SGGW
Assumptions, goals and description of the course:	The aim of the course is to present the factors initiating the formation of nitro-oxidative stress and the impact of this stress on metabolism of animals and plants cells. The interaction of ROS and RNS (RONS cross-talk), their dual physiological function in the cell and the activity of the system modulating the RNS level will be characterized. The mode of action of oxidized or nitrated metabolites and their physiological effects will be presented. Experiment: analysis of alterations in the ROS/RNS content in the selected experimental material and/or analysis of the content of modified metabolites in the selected experimental material, determination of alterations in the activity of ROS concentration modulators in the cell.
Didactic form, number of hours:	15 hours
Teaching methods:	Presentation, experiment conducted in subgroups, lecture using audiovisual techniques
Limit of people in the group:	10

Learning outcomes

KNOWLEDGE - the graduate knows and understands:	**SKILLS - the graduate is able to:**	**COMPETENCES - the graduate is ready to:**
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

The method of verification of learning outcomes:	presentation of a selected topic
Form of documentation of achieved learning outcomes:	student's name worksheet
Elements and weights of the final grade:	presentation of the selected topic 100%
Place of the course:	seminar room, laboratory

Basic and supplementary literature

Current publications on the topic from reputable journals with a high impact factor, e.g. Free Radicals and Medicine, Nitric Oxide

Comments:	

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:

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
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