Course title:	Theory of seeing and image analysis in the study of plant anatomy and movements
Course title in Polish:	Teoria widzenia oraz analiza obrazu w badaniach anatomii i ruchów roślin
Course for discipline:	all disciplines

Semester:	8	**Status of course:**	faculty	**Language:**	english
Academic year:		**Catalog number:**			

Coordinator of course:	dr hab. Urszula Zajączkowska, prof. SGGW
Lecturer od course:	dr hab. Urszula Zajączkowska, prof. SGGW
Executing unit:	Institute of Forest Sciences
Ordering unit:	Doctoral School SGGW
Assumptions, goals and description of the course:	The main idea of the class is to learn an interdisciplinary approach to the theory of seeing and digital image analysis. During the class, the fundamentals of the process of looking proposed by, among others, Polish masters of the avant-garde are introduced and the understanding of the digital image as a separate form of recording the characteristics of space is developed. Introduced concepts such as analog image, digital image, color, line, image histogram, among others, are developed as tools for scientific analysis of images (especially microscopic images). Students will also learn the methods of time-lapse film as well as fast-frame film. They will deepen their learning through anatomical studies and basic image analysis of the preparations made. In the event of the opening of an art exhibition relating to the theoretical issues of recording space and its transformation, it will be scheduled to visit and discuss it, possibly directly contacting the artist.
Didactic form, number of hours:	lecture, 10h
Teaching methods:	Conversational lecture, digital image analysis, art exhibition
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:	Assessment of activity during classes, analysis of plant movements
Form of documentation of achieved learning outcomes:	Attendance list and evaluation card
Elements and weights of the final grade:	Activity during classes 50%, analysis of plant movements 50%
Place of the course:	A classroom, possibly a museum or art gallery

Basic and supplementary literature

Image Analysis for the Biological Sciences C. Glasbey i G. Horgan, 1995 Willey

Comments:	

Estimated number of hours of work of the doctoral student necessary to achieve the assumed learning outcomes:	10

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