Course Unit Descriptor

Study Programme: PhD in Molecular Biology		
Course Unit Title: Advanced plant genetics		
Course Unit Code: DMB006		
Name of Lecturer(s): Nataša Kočiš Tubić, PhD		
Type and Level of Studies: Doctoral studies		
Course Status (compulsory/elective): elective		
Semester (winter/summer): winter/summer		
Language of instruction: English		
Mode of course unit delivery (face-to-face/distance learning): face-to-face		
Number of ECTS Allocated: 15		
Prerequisites: Previous consultation with a professor that will define form of engagement and course tasks depending on previous courses and current acquirements of a student.		
Course Aims: The course objective is to adopt knowledge on organisation of the nuclear and non-nuclear plant genome; methods and strategies of different molecular markers analyses (nuclear and chloroplast markers); how does information of genetic diversity and genetic structure contribute to understanding the causes, mechanisms and consequences of plant invasions; marker-assisted selection (MAS) in breeding of economic important plants		
Course Outcomes: After successfully realized the pre-exam and exam commitments student is able to: (i) explain role and importance of genetic polymorphism in natural plant populations; (ii) observe special characteristics of different molecular markers, distinguish their advantages and disadvantages depending on type of genetic analysis; (iii) define the importance of population genetics research in understanding the expansion of invasive plant species; (iv) explain role and importance of molecular markers and genetic mapping in plant breeding		
Syllabus: *Theory* Organisation of the plant genome. Role and importance of genetic polymorphism. Characteristics and application of diffrent molecular markers, nuclear and chloroplast, in assessment of genetic diversity, plant species identification, genetic delimitation of biological species, and in phylogenetic analyses. Plant DNA barcoding: choosing and using. DNA barcoding: from gene to genome, NGS technology and super-barcoding. Genetics of plant invasion: genetic diversity and genetic structure in invasive plant populations; genetic mehanisms underlying the expansion of invasive plant species; importance of using genetic analyses in invasive plant management and reconstruction of invasion histories. Linkage maps, QTL (quantitative traits loci) analysis, MAS- marker-assisted selection. *Practice* The structure of practical work is in accordance with candidat's field of research and the subject of PhD thesis.		
Required Reading: New literature and papers published in leading international scientific journals.		
Total hours:	Lectures: 5	Student research work: 5
Teaching Methods: lectures, student research work, consultations		
Knowledge Assessment (maximum of 100 points):		
Requirements Seminar: 40 points; Oral exam: 60 points		