1. Title of subject/module/unit				**Plant Molecular Genetics and Genomics**				
2. Unit code				**3. Number of ECTS credits**		**7**		
4. Contact hours		**Total 56**		**L 24**	**E 24**	**S 8**		**Other forms**
5. Cycle	**Master´s**	**6. Year**	**1st**		**7. Semester**	**1st**		
8. Study programme		**International Master of Science in Horticulture**			**9. Branch of study**			
10. Pillar of the programme		**Compulsory**			**11. Language**	**English**		
12. Special features								

13. Objectives and subject-specific competences	Knowledge on structure and function of plant genomes, *Arabidopsis thaliana* as a model plant genome, experimental methods of genome analysis, genome evolution, comparative genomics, practical applications of plant molecular genetics and genomics.	
14. Description of content	Structural, functional, and comparative genomics, genetic mapping and association mapping of plant genomes, whole genome sequencing – methods and perspectives, structure of plant genomes, repetitive DNA – origin and function, mechanisms of genome evolution, comparative genomics, functional genomics, gene expression and its regulation, molecular basis of genetic variation, plant organelle genetics, methods for global gene expression analysis, molecular assessment of genetic diversity, genomics-assisted crop improvement	
15. Basic bibliografy	Lankenau D-H, Volff J-N (eds.), 2009. Transposons and the Dynamic Genome. Springer, Dordrecht. Meksem K, Kahl G (eds.), 2005. The Handbook of Plant Genome Mapping. Wiley-VCH, Weinheim. Sensen CW (ed.), 2005. Handbook of Genome Research. Wiley-VCH, Weinheim, vol. 1 and 2. The Arabidopsis Genome Initiative, 2000. Analysis of the genome sequence of the flowering plant *Arabidopsis thaliana*. Nature 408: 796-815. Varshney RK, Tuberosa R (eds.), 2007. Genomics-Assisted Crop Improvement. Springer, Dordrecht, vol. 1 and 2. Krebs J.E., Goldstein E.S, Kilpatrick S.T. (2011) Lewin's Genes X. 10th Ed. Jones and Bartlett Publishers. Trends in Plant Science – Cell Press.	
16. Envisaged learning outcomes	*16.1 Knowledge and understanding*	The student defines the scope of molecular genetics and genomics, describes structure of the eukaryotic genome, presents strategies and techniques of genome sequencing and annotation, presents basic issues on genome evolution, describes genomics-based approaches to crop improvement**.**
	16.2 Application	The student applies basic bioinformatic tools for the analysis of DNA sequence, interprets results of bioinformatic analyses, uses online resources and reports results.
	16.3 Reflection	The student is capable of formulating unbiased opinions on the use of molecular genetics and genomics in crop improvement.

	16.4 Transferable skills – not tied to just one subject	Teamwork, ability to present and defend personal opinions.
17. Methods of teaching and learning	Lectures, laboratory practicals and seminars.	
18. Conditions for inclusion or to undertake work required	Enrolment in the year of the course. Pre-requisite is a basic course in genetics and biochemistry. Basic computer skills.	
19. Methods of assessment and the assessment scale	- Written exam (40%) and oral presentation (40%) - Attendance at laboratory practicals and preparation of laboratory reports (20%) Evaluation scale: Grades from 2.0 (worst) to 5.0 (best)	
20. Method of evaluation of course quality	Student questionnaire.	
21. Curriculum compiler	Dr. DariuszGrzebelus, University of Agriculture in Krakow Dr. Marek Szklarczyk, University of Agriculture in Krakow	