BI1339 Experimental approaches in plant growth analysis and phenotyping, 15 hp, autumn 2022 - Schedule version 1.1

Sections with **green text** are the parts that are also included in the **PhD course**

Please note that some classes require some preparatory work!

Unless otherwise noted, the literature is compulsory. Refer to the course literature information and Canvas for details on the literature

	Day	Month	Time	Part	Room Booked	Type	Session	Summary of the content	Reading/Preparation	Teachers
Mon	29	8	10-12		Ladan	S	Course start and introduction; project presentation	General course idea, distribution of literature to be reviewed for examination (PhD students), grading criteria, logistics and housekeeping		MW
Mon	29	8	13-16	Project A	Ladan (13-14)	E	Project work (willow project)	Growth assessments (mostly in a willow field trial which is located nearby the Ultuna campus)		MW, NEN, CG
Wed	31	8	9-10:15	Tools	Ladan	L	The scientific method	The process of scientific investigation from idea to publication is explored with special focus on the role and importance of hypothesis	See under "Literature to lectures & exercises" at Canvas	RG
Wed	31	8	10:30-12	Tools	Ladan	L	Tools for project work	Basics on experimental planning, design, execution and reporting		MW
Thu	1	9	9-12	Plant growth theory & assessment	Ladan	L	Photosynthesis from scratch to plant production in northern latitudes	Photosynthesis and growth in relation to external factors, with focus on the opportunities for plant growth improvements.	See under "Literature to lectures & exercises" at Canvas	MW
Fri	2	9	9-12	Tools	Ladan	E	Basic statistics	Training in basic statistics by going through some of the relevant methods and actually doing the data analysis from the growth assessments in project A	Text book: *Practical Statistics for Field Biology* by J. Fowler, L. Cohen & P. Jarvis (many copies are available at the SLU library)	CG, IK
Fri	2	9	13-16	Tools	Ladan	L	Data analysis "Dugga" (diagnostic test and exercise)	Discussion of several case studies for statistical problems relevant to the project work	See under "Literature to lectures & exercises" at Canvas, and **prepare before class according to the instructions**!	MW
Mon	5	9	9-12	Project B		E		Re-planting birch, planting wheat, harvest 1		*NN*
Mon	5	9	13-16	Plant growth theory & assessment	Ladan	L/S	Growth analysis	Theory and methodology for plant growth analysis	See under "Literature to lectures & exercises" at Canvas	MW
Wed	7	9	9-12	Plant growth theory & assessment	Ladan	L/S	Plant-plant interaction	Assessment of plant-plant interaction, and case study for the evaluation of plant-plant interaction in a willow field trial	See under "Literature to lectures & exercises" at Canvas	MW
Thu	8	9	9-12	Plant growth theory & assessment	Ladan	L/S/E	Plant-plant interaction	Experimental methods to investigate plant-plant interactions, e.g. pairwise experiments, additive series, replacement series, surface response models	See under "Literature to lectures & exercises" at Canvas	AM
Fri	9	9	9-16 (lunch break 12-13)	Plant growth theory & assessment	Ladan	L/S	Plant nutrient use efficiency	Theory and methodology for the assessment of plant nutrient use efficiency, case studies (wheat and wheat-legume mixtures) illustrating different methodologies	See under "Literature to lectures & exercises" at Canvas	MW, OJ, others
Mon	12	9	9-12	Project B	Ladan	E	Introduction project B assessments	Measuring external growth factors (e.g. light), measuring photosynthesis, discussion of various possibilities for physiol. assessments		MW, *NN*
Mon	12	9	13-16	Projects A, B		E		Project work		
Wed	14	9	9-12	Projects A, B		E		Project work		
Thu	15	9	9-12	Projects A, B		E		Project work		
Fri	16	9	9-16	Projects A, B		E		Project work		
Mon	19	9	Deadline project A (willow) report!							
Mon	19	9	9-10	Project B	Ladan	E	Project follow-up	Wheat-birch project discussions		MW, *NN*
Mon	19	9	10-16	Plant growth theory & assessment	Ladan	L/S	Plant growth modelling	What is a model, and why do we model? Introduction to modelling approaches and how modelling can be used in plant phenotyping	See under "Literature to lectures & exercises" at Canvas	MW?
Wed	21	9	9-12	Project B		E		Project work		
Thu	22	9	9-12	Reserve slot	Ladan					MW
Fri	23	9	9-16	Project B		E		Project work		
Mon	26	9	9-12	Project B		E		Project work		
Mon	26	9	13-14	Project B	Ladan	E	Project follow-up	Wheat-birch project discussions		MW, *NN*
Mon	26	9	14-16	Project B		E		Project work		
Wed	28	9	9-12	Project B		E		Project work (Harvest 2)		
Thu	29	9	9-12	Project B		E		Project work (Harvest 2)		
Fri	30	9	9-11	Examination		S	Written exam I			MW
Fri	30	9	11-12	Project B	Ladan	E	Project follow-up	Wheat-birch project discussions		MW, *NN*
Fri	30	9	13-16	Project B		E		Project work (incl. mini-documentaries)		
Mon	3	10	9-16	Project B		E		Project work (data analysis & writing)		
Wed	5	10	9-12	Project B		E		Project work (data analysis & writing)		
Thu	6	10	9-12	Project B		E		Project work (data analysis & writing)		
Fri	7	10	9-16	Project B		E		Project work (data analysis & writing)		
Mon	10	10	9-16	Project B		E		Project work (Harvest 3)		
Wed	12	10	9-12	Project B		E		Project work (data analysis & writing)		
Thu	13	10	9-12	Project B		E		Project work (data analysis & writing)		
Fri	14	10	9-16	Projects A, B		E		Project work (incl. mini-documentaries)		
Mon	17	10	9-10	Plant phenotyping	Ladan	S	Phenotyping applications	Introduction plant phenotyping; phenotypic plasticity		MW
Mon	17	10	10-12	Plant phenotyping	Tamm	S	Phenotyping applications	Case studies for rapid assessments of growth and development of plants and plant parts	See under "Literature to lectures & exercises" at Canvas	AC (videolink)
Mon	17	10	13-14	Project B	Ladan	E	Project follow-up	Wheat-birch project discussions		MW, *NN*
Mon	17	10	14-16	Project B		E		Project work		
Wed	19	10	9-12	Plant phenotyping	Ladan	S	Phenotyping applications	What are phenotypes? What are their properties and dimensions? What are the factors driving and limiting plant growth? What is phenotypic plasticity and why is it important to study?	See under "Literature to lectures & exercises" at Canvas	FF

Thu	20	10	9-12	Plant phenotyping	Ladan	S	Phenotyping applications	Imaging technologies for non-invasive analyses of plant growth, tomographic technologies, high-throughput phenotyping platforms		FF
Fri	21	10	9-16	Plant phenotyping	Tamm	S	Phenotyping applications	Application of phenomics to assess the genotype by environment interaction, closing the genotype – phenotype knowledge gap, physiological phenotyping, applications in climate-smart breeding and digital farming		TR (videolink or in person)
Mon	24	10	9-11	Examination		S	Written exam II			MW
Mon	24	10	11-12	Project B	Ladan	E	Project follow-up	Wheat-birch project discussions		MW, *NN*
Mon	24	10	13-16	Projects A, B		E		Preparations of project presentations		
Wed	26	10	9-11	Plant phenotyping	Ladan	S	Phenotyping applications - trophic interactions	Case studies, e.g. detecting and monitoring potato virus infections using infrared technology		VN
Wed	26	10	13-15					Study visit to "Digital agriculture test platform"		MW
Thu	27	10	9-12	Projects A, B		E		Preparations of project presentations		
Fri	28	10	9-12	Mini-symposium (examination)	F-salen	S	Project presentations (incl. PhD student projects), final discussions, course evaluation			MW
Wed	2	11	Deadline project B (birch-wheat) report!							

Course Leader

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Location

Various locations at the SLU Ecology centre, Ulls väg 16, Uppsala

Type

L	Lecture.
E, S	Exercise (E) and seminars (S). **Obligatory** attendance. An extra assignment is usually required if you miss the class.
P	Project. Introductory project presentations and the final mini-symposium are **obligatory** sessions. The rest of the scheduled project time is used in agreement between the teachers and the project group

Clarification of teachers' initials

AC	Aakash Chawade (SLU Alnarp)
AM	Alexander Menegat
CG	Carolyn Glynn
FF	Fabio Fiorani (Forschungszentrum Jülich, Germany)
IK	Ida Kollberg
MW	Martin Weih
NEN	Nils-Erik Nordh
OJ	Ortrud Jäck
RG	Robert Glinwood
TR	Thomas Roitsch (Univ. of Copenhagen, Denmark)
VN	Velemir Ninkovic