

**Course start:** 2010-08-30  
09.00

**Location:** KBC, Umeå University  
Room KB4C10

**Main teachers:**

Vaughan Hurry (UmU)	VH	090 786 68 45	<a href="mailto:vaughan.hurry@plantphys.umu.se">vaughan.hurry@plantphys.umu.se</a>
Ulrika Ganeteg (SLU)	UG	090 786 84 31	<a href="mailto:ulrika.ganeteg@genfys.slu.se">ulrika.ganeteg@genfys.slu.se</a>

**The components of the course:**

I. Lectures

II. Laboratory exercises: Compulsory, lab reports are written for all lab exercises

LAB 1: Respiration

LAB 2: Carbohydrates

LAB 3: Nitrogen fixation

III. Seminar presentation: Compulsory

IV. Written Report Exercise: Compulsory

V. Demonstration: Confocal microscopy: Attendance compulsory

**Course literature:** Plant Physiology V ed. (Taiz and Zeigler)  
Not released yet. Will become available during summer.  
Some on-line book-stores have pre-bookings

OR :

Plant Physiology IV ed. (Taiz and Zeigler, ISBN# 0-87893-856-7)

**Recommended reading:** Essential Cell Biology II ed (Alberts, ISBN# 081533480X  
(hardback); ISBN0815334818 (paperback)

Plant Biochemistry (Bowsher, Steer and Tobin)  
ISBN# 0-8153-4121-0

**Examination:** Written exam: Thursday 4/11, 2010  
Written report  
Lab Reports

**Lecturers:**

<b>Laszlo Bako</b>	LB	<a href="mailto:Laszlo.Bako@plantphys.umu.se">Laszlo.Bako@plantphys.umu.se</a>
<b>Ulrika Ganeteg</b>	UG	<a href="mailto:Ulrika.Ganeteg@genfys.slu.se">Ulrika.Ganeteg@genfys.slu.se</a>
<b>Per Gardeström</b>	PG	<a href="mailto:Per.Gardestrom@plantphys.umu.se">Per.Gardestrom@plantphys.umu.se</a>
<b>Markus Grebe</b>	MG	<a href="mailto:Markus.Grebe@genfys.slu.se">Markus.Grebe@genfys.slu.se</a>
<b>Vaughan Hurry</b>	VH	<a href="mailto:Vaughan.Hurry@plantphys.umu.se">Vaughan.Hurry@plantphys.umu.se</a>
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<b>Ewa Mellerowicz</b>	EM	<a href="mailto:Ewa.Mellerowicz@genfys.slu.se">Ewa.Mellerowicz@genfys.slu.se</a>
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<b>Anita Sellstedt</b>	AS	<a href="mailto:Anita.Sellstedt@plantphys.umu.se">Anita.Sellstedt@plantphys.umu.se</a>
<b>Åsa Strand</b>	ÅS	<a href="mailto:Asa.Strand@plantphys.umu.se">Asa.Strand@plantphys.umu.se</a>

**Teaching Assistants:**

<b>Bastiaan Brouwer</b>	BB	<a href="mailto:Bastiaan.Brouwer@plantphys.umu.se">Bastiaan.Brouwer@plantphys.umu.se</a>
<b>Sabine Kunz</b>	SK	<a href="mailto:sabine.kunz@plantphys.umu.se">sabine.kunz@plantphys.umu.se</a>
<b>Dmitry kremnev</b>	DK	<a href="mailto:dmitry.kremnev@plantphys.umu.se">dmitry.kremnev@plantphys.umu.se</a>
<b>Marcia Rosa</b>	MR	<a href="mailto:Marcia.Rosa@plantphys.umu.se">Marcia.Rosa@plantphys.umu.se</a>

**List of lectures:**

The plant cell

How to write a written report and give a seminar presentation

Good Laboratory Practice; How to write a lab report

Genomes and signalling

Study protein functions in plants

Signal perception and transduction

Introduction to photosynthesis

Energy transduction

Antenna complexes

Water splitting catalysts

Artificial photosynthesis

Calvin cycle

Respiration

Photorespiration

Protein synthesis, assembly and degradation

Carbohydrate synthesis and applications

Mineral nutrition

Nitrogen fixation

Membrane transport

Root uptake of nitrogen from soil

Assimilation of nutrients

The cytoskeleton

Protein vesicle transport

The cell wall

Monday 30/8	09.00 – 10.00 10.00 – 11.00	Course Introduction (VH, UG) The Plant Cell (UG)
Tuesday 31/8	09.00 – 11.00	How to write a written report and present a seminar (VH) <i>Select topic for seminar presentation/written report</i>
Wednesday 1/9	09.00 – 11.00	Good laboratory Practice, How to write a lab report (TAs, VH, UG)
Thursday 2/9	09.00 – 11.00 13.00 – 15.00	Genomes and signalling (ÅS) Studying protein function in plants (LK)
Friday 3/9	09.00 – 11.00	Signal perception and transduction, (ÅS)  <i>Work with seminar presentation/written report</i>
Saturday 4/9		
Sunday 5/9		
Monday 6/9	09.00 – 11.00	Introduction to photosynthesis (VH)  <i>Work with seminar presentation/written report</i>
Tuesday 7/9	09.00 – 10.00 10.00 – 11.00 12.00 –	Energy transduction (VH) Antenna complexes (VH) Update of seminar presentation/ written report (VH)
Wednesday 8/9		<i>Work with seminar presentation/written report</i>
Thursday 9/9		<i>Work with seminar presentation/written report</i>
Friday 10/9	09.00 – 10.00 10.00 – 11.00	Water splitting catalysts (JM) Artificial photosynthesis (JM)  <i>Work with seminar presentation/written report</i>
Saturday 11/9		
Sunday 12/9		

Monday 13/9	09.00 – 10.00 9.00-11.00	Calvin cycle (VH) Respiration (PG)
Tuesday 14/9	9.00-12.00	LAB 1: Introduction and preparation for LAB 1 (Bas)
Wednesday 15/9		STUDENTS SPORT DAY
Thursday 16/9	09.00-17.00	Group A. LAB 1. Isolation of mitochondria (PG, BB) Group B. <i>Work with seminar presentation/written report</i>
Friday 17/9	09.00-17.00	Group A. <i>Work with seminar presentation/written report</i> Group B. LAB 1. Isolation of mitochondria (PG, BB)
Saturday 18/9		
Sunday 19/9		
Monday 20/9	09.00-11.00 12.00-17.00	Photorespiration (PG) LAB 1. Protein determination/SDS-PAGE (BB)
Tuesday 21/9	09.00 – 17.00	LAB 1. Western blot (BB)
Wednesday 22/9	09.00 – 17.00	LAB 1. Calculations/Lab report (PG, BB)
Thursday 23/9	09.00 – 11.00	Protein synthesis, assembly and degradation I (LB) <i>Work with seminar presentation/written report</i>
Friday 24/9	09.00 – 11.00 12.00	Protein synthesis, assembly and degradation II (LB) Update of seminar presentation/ written report (VH) <i>Work with seminar presentation/written report</i>
Saturday 25/9		
Sunday 26/9		

Monday 27/9	09.00 – 11.00	Carbohydrate synthesis and applications (LK)
	11.15 – 11.45	How to search for scientific literature (LK)
Tuesday 28/9	9.00 – 9.30	Introduction to LAB 2 (LK, SK)
	9.45 – ca 17.30	LAB 2. Carbohydrates - Group A (SK) Group B. <i>Work with seminar presentation/written report</i>
Wednesday 29/9	9.00 – ca 17.00	LAB 2. Carbohydrates – Group B (SK) Group A. <i>Work with seminar presentation/written report</i>
Thursday 30/9	9.00 – 12.00	Paper discussion (LK)
	13.00 –	LAB 2. Calculations, writing reports (LK, SK)
Friday 1/10	9.00 – 11.00	Lab summing up (LAB2) (LK, SK)  <i>Work with seminar presentation/written report</i> <b>Lab 1. Deadline Lab report</b>
Saturday 2/10		
Sunday 3/10		
Monday 4/10	09.00 – 11.00	Mineral Nutrition, AS
	12.00	Update of seminar presentation/ written report (VH) <i>Work with seminar presentation/written report</i>
Tuesday 5/10	09.00 – 11.00	Nitrogen Fixation, AS
		<i>Work with seminar presentation/written report</i>
Wednesday 6/10	09.00 – 10.00	Lab 3. Introduction GROUP A (AS, DK)
	10.00 – 17.00	Lab 3. Nitrogen Fixation GROUP A (DK)
		Group B. <i>Work with seminar presentation/written report</i>
Thursday 7/10	09.00 – 10.00	Lab 3. Introduction GROUP B (AS, DK)
	10.00 – 17.00	Lab 3. Nitrogen Fixation GROUP B (DK)
		Group A. <i>Work with seminar presentation/written report</i>
Friday 8/10	09.00 – 12.00	Membrane Transport, (UG) Root uptake of N from soil, (UG)
	13.00 –	Lab 3. Calculations / Lab Report (AS, DK)
		<b>Lab 2. Deadline Lab report / Lab 1. Last Deadline</b>
Saturday 9/10		
Sunday 10/10		

Monday 11/10	9.00 – 11.00  12.00	Assimilation of nutrients, (AS)  Update of seminar presentation/ written report (VH) <i>Work with seminar presentation/written report</i>
Tuesday 12/10	9.00 – 12.00	<i>Work with seminar presentation/written report</i>
Wednesday 13/10	9.00 – 12.00	Seminar Presentations
Thursday 14/10	9.00 – 12.00	Seminar Presentations
Friday 15/10	9.00 – 12.00	Seminar Presentations  <b>Lab 3. Deadline Lab report</b> <b>Lab 2. Last Deadline</b>
Saturday 16/10		
Sunday 17/10		
Monday 18/10	9.00 – 11.00	The cytoskeleton (MG)  <i>Work with written report</i>
Tuesday 19/10	9.00 – 11.00	Protein vesicle transport, (MG)  <i>Work with written report</i>
Wednesday 20/10	9.00 – 11.00	The Cell Wall I, (EM)  <i>Work with written report</i>
Thursday 21/10	9.00 – 11.00	The Cell Wall II, (EM)  <i>Work with written report</i>
Friday 22/10	9.00 –	Demonstration: Confocal microscopy (MR) (Detailed scheduled to be presented later)  <b>Lab 3. Last Deadline</b>
Saturday 23/10		
Sunday 24/10		

Monday 25/10	<i>Work with written report</i>
Tuesday 26/10	<i>Work with written report</i>
Wednesday 27/10	<i>Work with written report</i>
Thursday 28/10	<i>Work with written report</i>
Friday 29/10	<b>Deadline Written Report</b>
Saturday 30/10	
Sunday 31/10	
Monday 1/11	<i>Study for exam</i>
Tuesday 2/11	<i>Study for exam</i>
Wednesday 3/11	<i>Study for exam</i>
Thursday 4/11	<b>EXAM</b>
Friday 5/11	