GÖTEBORGS UNIVERSITET

Chlorophyll fluorescence – principles and applications, 4 credits

Course period: May 9-13th, 2016 Main location of the course: Department of Biological and Environmental Sciences (Botanical house)	Last day for application: April 8th, 2016

Course leader/Address for applications:

Cornelia Spetea Wiklund /cornelia.spetea.wiklund@bioenv.gu.se

Course description (Advertisement for Ph.D. students):

Chlorophyll fluorescence analysis is one of the most powerful and widely used techniques by plant physiologists and ecophysiologists. The course will consist of lectures related to the theoretical background of this method and practicals to illustrate the types of information that fluorescence can provide. Practicals will be given for groups of 5 students on available instruments (DUAL-PAM-100, Phyto-PAM, Water-PAM, Junior-PAM, Pocket- and Handy-PEA). The analyzed samples will be from cyanobacteria, algae and plants.

The course will consist of lectures, group discussions and practicals of how to use various chlorophyll fluorometers to solve specific physiological questions. During the course, the students will have the opportunity to work on a research problem of their own using chlorophyll fluorescence.

Number of participants: maximum 15. The course is full time and all activities are compulsory. It will take place at University of Gothenburg, Department of Biological and Environmental Sciences, Botany building, Carl Skottsbergs gata 22B, Gothenburg.

This course was previously given 2011 and received very good evaluation from the students.

Responsible department and other participating departments/organisations:

Responsible: Department of Biological and Environmental Sciences (BioEnv).

Teachers:
Cornelia Spetea Wiklund (Course leader and main contact)
BioEnv teachers: Cornelia Spetea Wiklund, Natàlia Corcoll
External teachers: Benoît Schoefs, University of Le Mans

Examiner: Cornelia Spetea Wiklund

GÖTEBORGS UNIVERSITET
Faculty of Science
Department of Biological and Environmental Sciences

Chlorophyll fluorescence– principles and applications, 4 credits

Third cycle education

---

1. Confirmation

The syllabus was confirmed by Lars Förlin, Head of the Department of Biological and Environmental Sciences, 2016-01-05.
The course plan is valid from 2016-01-25.

Disciplinary domain: Science
Department in charge: Department of Biological and Environmental Sciences

Main field of study: Biology

2. Position in the educational system

Elective course; third-cycle education.

3. Entry requirements

The PhD students should be admitted to third cycle education and work on a project within plant physiology or marine ecology/ecotoxicology. Therefore, they are expected to have used or to plan to use chlorophyll fluorescence during their research projects.

In preparation for the course, students are requested to prepare and give a 3 min presentation about their ongoing work. The presentations will be during the first day of the course.

4. Course content

The course will consist of lectures about methodology and applications, group discussions and practicals of how to use various PAM fluorometers to solve specific physiological questions. During the course, the students will have the opportunity to work on a research problem of their own using chlorophyll fluorescence. They can bring an example of their own biological samples to use during the course. Upon completion of the course, the students should have a good understanding of the principles of the method, and choose appropriate type of fluorometer for solving specific questions.

5. Outcomes
After completion of the course the Ph.D. student is expected to be able to:

1. Knowledge and understanding
- describe the principles of chlorophyll fluorescence
- understand the type of information this method provides about physiology

2. Skills and abilities
- get hands-on instruments available at University of Gothenburg
- network with other scientists within the field

3. Judgement and approach
- evaluate the use of a certain instrument to answer specific questions
- discuss their PhD research projects with experts in the field

6. Required reading
The reading list is supplied separate to the syllabus. Students are required to prepare themselves and read the assigned literature before we meet.

7. Assessment
At the beginning of the course, the PhD students are requested to give a 3 min presentation on their ongoing research. At the end of the course, the students will present their results on a problem-oriented practical. In addition they will need to send to the course organizer a written report on the following task: How would you use Chlorophyll fluorescence in your research? Briefly present the background, problem, design and the experiments to be performed (max. 2 pages via email).

All course activities require obligatory attendance for a Pass grade.

A participating PhD student has the right to change examiner after he twice failed the same examination, if applicable. Such a request is made to the department and must be written.

8. Grading scale
The grading scale comprises Fail (U), Pass (G)

9. Course evaluation
Course evaluation is carried out together with the Ph.D. students at the end of the course, and is followed by an individual, anonymous survey. The results and possible changes in the

course will be shared with the students who participated in the evaluation and to those who are beginning a subsequent course.

10. Language of instruction
The language of instruction is English.

Additional information

Course programme
The course starts on Mon with introduction at 13:15.
There will be lectures Mon, Tue and Wed, and practicals Tue and Wed. There will be student 3 min presentations on Mon. On Thu the students will have the opportunity to work on a problem of their own or given by the organizers. The course will end on Fri at lunch with student presentations and discussions on the problem-oriented practicals.

Practical information
Dept. of Biological and Environmental Sciences is located in the Gothenburg Botanical Garden www.bioenv.gu.se

Suggestions for places to stay at a reasonable price
Slottskogens Vandrarhem (Phone 46-31-426520; http://www.sov.nu)

Linne Vandrarhem (Phone 46-31-121060; http://www.vandrarhemmet-linne.com/)

Participation throughout the course, dinner on Monday evening and lunches Tue-Fri are for free.

Registration information
Send application via email to cornelia.spetea.wiklund@bioenv.gu.se **no later than April 8th, 2016**. Please, provide the following information:

- Your name and address
- A summary of ongoing research (max. 250 words). You will need to bring a short PPT presentation with you about your research.
- Info about the use of chlorophyll fluorescence in the project
- You may send a research problem you would like to work on during the practicals on Thu together with an expert scientist. If you do not have a problem, we will provide you with one.
- Info about special diet requirements.

We will organize the students in groups based on the type of projects they work on and problem to answer.

You will be notified on your status **no later than April 15th, 2016**.