Course Syllabus

1. **Program of Study** Bachelor of Science in Plant Science **Faculty** Science
2. **Course Code** SCPL 311 **Course Title** Plant Physiology I
3. **Number of Credits** 3 (2-3) (Lecture-Lab)
4. **Prerequisite** SCPL 303 or SCPL 304
5. **Type of Course** Compulsory course
6. **Session** Second semester / 2018
7. **Course Conditions** -
8. **Course Description**

Absorption and translocation of water and solutes, transport process, water balance of the plant, mineral nutrition, phloem translocation, photosynthesis, respiration and stress physiology

9. **Course Objective(s)**

After successful completion of this course, students will be able to

9.1 understand the relationship of water, soil and atmosphere on plant growth and development

9.2 understand the role of transportation of water and solutes during life cycle

9.3 understand the mechanism and function of photosynthesis and respiration

9.4 understand the physiological responses of plant grown under stress condition

10. **Course Outline**

Time: Mon; 9.30-12.30; lab. hour
Mon; 12.30-15.30; lecture hour

Room: N300

Date	Wk	Topic		Instructor
		Lecture	Lab	
14 Jan	1	Introduction, concept in plant physiology Mineral nutrition I : Kind and its activity	Nutrient use in Hydroponic; VDO	Aussanee, TA
21 Jan	2	Mineral nutrition II : Deficiency, solute transport	Preparing nutrient solution for culture; VDO	Aussanee, TA
28 Jan	3	Plant & water relations, Water translocation I	Estimation of water potential in tuber	Ngarmnij, TA
4 Feb	4	Water translocation II	Estimation of water potential in flower	Ngarmnij, TA
11 Feb	5	Translocation in phloem: Mechanism, assimilation and partitioning	Knowledge use; reverse translocation for high productivity	Aussanee, TA
18 Feb	6	1st Exam (mineral, water, translocation in xylem)		Ngarmnij, TA
25 Feb	7	Photosynthesis: The light dependent reactions	Separation of chloroplast pigments	Ngarmnij, TA
4 Mar	8	Photosynthesis: The light dependent and independent reactions	Effect of light intensity on photosynthesis rate	Ngarmnij, TA
11 Mar	10	Photosynthesis: The light independent reaction	Effect of CO_2 on photosynthesis	Ngarmnij, TA
18 Mar	11	2nd Exam (photosynthesis & translocation in phloem)		Aussanee, TA
25 Mar	12	Respiration & electron transport I	Cellular respiration in plant; VDO	Ngarmnij, TA
1 Apr	13	Respiration & electron transport II	Estimation of CO2 compensation points and Anaerobic respiration: alcoholic fermentation	Ngarmnij, TA
8 Apr	14	Holidays (No class)		Ngarmnij, TA
22 Apr	15	Stress physiology: Stress factors, Plant adaptation	Stress physiology: study case on algae for oil production (Metha)	Aussanee, Metha, TA
29 Apr	16	Photosynthesis characters in plant factory condition (Kriengkrai)	Global warming effect (Student Presentation)	Kriengkrai, Aussanee, TA
6 May	16	Holidays (No class)		
13 May	17	3rd Exam (respiration & stress)		Aussanee, TA

11. **Teaching Method (s)** lecture tutorial problem solving self-study
12. **Teaching Media** lecture note, problem sets
13. **Measurement and Evaluation of Student Achievement**

Student achievement is measured and evaluated by

13.1 the ability to predict general plant response from the effects of water and solutes

13.2 the ability in analyzing plant symptoms that related with the nutritional effect

13.3 the ability to apply the knowledge of photosynthesis, respiration and water relationship on plant production

Student achievement will be graded according to the faculty and university standard using the symbols: A, B+, B, C+, C, D+, D, and F.

Students must have attended at least 80% of the total class hours of this course.

Evaluation criteria:	1^{st}, 2^{nd}, 3^{rd} Exam	26+26+26 = 78%
	Reports / presentation (Lab)	18 %
	Attendance	4 %

14. Course Evaluation

14.1 Evaluate as indicated in number 13 above.

14.2 Evaluate student' satisfaction towards teaching and learning of the course using a questionnaire

15. Reference(s)

- Tiaz, L. And E. Zeiger. 2002. Plant Physiology, 3^{rd} ed. Sinauer Associates, Inc.
- Hopkins, W.G. and N.P. A. Huner. 2004. Introduction to Plant Physiology, 3^{rd} ed. John Wiley & Sons, Inc.
- Ridge, I (ed). 2002. Plants. Oxford University Press.

16. Instructor(s)

- Dr. Aussanee Pichakum, SCPL, MU
- Dr. Ngarmnij Chuenboonngarm, SCPL, MU
- Dr. Metha Meetham, SCBI, MU
- Dr. Kriengkrai Mosaleeyanon, BIOTEC

17. Course Coordinators:

- Dr. Aussanee Pichakum (aussanee.pic@mahidol.ac.th)
- Dr. Ngarmnij Chuenboonngarm (ngarmnij.chu@mahidol.ac.th)