The University of Southern Queensland

Course specification

The current and official versions of the course specifications are available on the web at <http://www.usq.edu.au/coursespecification/current>.
Please consult the web for updates that may occur during the year.

Description: Plant Physiology

Subject	Cat-nbr	Class	Term	Mode	Units	Campus
BIO	2202	91581	2, 2009	ONC	1.00	Toowoomba

Academic group: FOSCI
Academic org: FOS002
Student contribution band: 6
ASCED code: 010903

STAFFING

Examiner: Mark Sutherland
Moderator: John Dearnaley

REQUISITES

Pre-requisite: BIO1101

OTHER REQUISITES

Recommended pre-requisite: BIO2103

RATIONALE

The aims of this course are to relate the structure of whole plants and their tissues to their known functions and to explore a selection of the major physiological processes which occur during plant growth and development and their interaction with the external environment.

SYNOPSIS

The course is designed to inform a broad spectrum of students in plant science, wine science, biotechnology, ecology and education. The course examines essential processes in the life of plants: water uptake and transpiration; the nutrient requirements of plants; the effects of nutrient deficiencies; the transport of salts, sugars and other biomolecules within the plant; cell growth and development; the roles of plant hormones and the strategies adopted by plants to withstand environmental stresses. The residential school is a compulsory component for this course.

OBJECTIVES

On completion of this course students will be able to:

1. demonstrate an understanding of how the different tissues and organs enable the plant to function as an integrated system, responsive to the interaction of internal and environmental processes (Mid-Semester Test, Exam);

2. demonstrate an understanding of the basic principles governing plant cell growth and the role of individual cell growth and development within the organism (Mid-Semester Test, Exam);
3. demonstrate an understanding of the effects of major environmental stresses on normal plant functioning and the anatomical and physiological adaptations plants have evolved to tolerate these external factors (Mid-Semester Test, Exam);
4. show skills in experimentation with plants in the laboratory and glasshouse (Report);
5. show improved skills in the written communication of scientific knowledge (Assignment).

TOPICS

	Description	Weighting (%)
1.	Plant water relationships: water potential and its components, the path of water through the plant, transpiration and water potential.	20.00
2.	Plant Nutrition: essential minerals and their function in the plant, mineral deficiencies and availability, solute transport across cell membranes, membrane transport proteins.	25.00
3.	Sugar transport: the products of photosynthesis, carbohydrate sources and sinks, the movement of phloem.	10.00
4.	Plant Growth and Development: plant cell growth and differentiation, growth and development of vegetative tissues, plant hormones and their action.	25.00
5.	Stress and Plant Ecophysiology: leaf surfaces and the role of stomates, adaptations to water stress and water logging, salinity and extremes of temperature.	20.00

TEXT and MATERIALS required to be PURCHASED or ACCESSED

ALL textbooks and materials are available for purchase from USQ BOOKSHOP (unless otherwise stated). Orders may be placed via secure internet, free fax 1800642453, phone 07 46312742 (within Australia), or mail. Overseas students should fax +61 7 46311743, or phone +61 7 46312742. For costs, further details, and internet ordering, use the 'Textbook Search' facility at http://bookshop.usq.edu.au click 'Semester', then enter your 'Course Code' (no spaces).

Pechenik, JA 2006, *A short guide to writing about biology*, 6th edn, Longman, New York. (ISBN 0 321 15981 0)

Sutherland, MW & Dearnaley, J 2009, 'Plant physiology practical notes' (Available: USQ Study desk).

Taiz, L & Zeiger, E 2006, *Plant physiology*, 4th edn, Sinauer Association, Sunderland, Mass.

REFERENCE MATERIALS

Reference materials are materials that, if accessed by students, may improve their knowledge and understanding of the material in the course and enrich their learning experience.

Arteca, RN 1996, *Plant growth substances principles and applications*, Chapman and Hall, New York.

Atwell, BJ, Kriedemann, PE & Turnbull, CGN 1999, *Plants in action: adaptation in nature, performance in cultivation*, MacMillan Education Australia, Victoria.

Basra, AS 2001, *Crop responses and adaptations to temperature stress*, Food Products Press, New York.

(ISBN 1-56022-890-3)

Benech-Arnold, RL & Sanchez, RA 2004, *Handbook of seed physiology*, Food Products Press, New York.

(ISBN 1 56022 929 2)

Buchanan, BB, Guissem, W & Jones, RL 2000, *Biochemistry and molecular biology of plants*, American Society of Plant Physiologists, Rockville, MD.

(ISBN 0-943088-39-9)

Hawes, C & Satiat-Jeunemaitre, B 2001, *Plant cell biology: a practical approach*, 2nd edn, Oxford University Press, Oxford.

(ISBN 0-19-963866-7)

Hayat, S & Ahmad, A 2003, *Brassinosteroids: bioactivity and crop productivity*, Kluwer Academic Publishers, Dordrecht.

(ISBN 1 4020 1710 3)

Hirt, H & Shinozaki, H (eds) 2003, *Topics in current genetics - plant responses to abiotic stress*, Springer, Berlin.

(ISBN 3 540 20037 1)

Hopkins, WG & Huner, NPA 2004, *Introduction to plant physiology*, 3rd edn, John Wiley and Sons, New York.

Marschner, H 1995, *Mineral nutrition of higher plants*, 2nd edn, Academic Press, London.

Nobel, PS 1999, *Physiochemical & environmental plant physiology*, 2nd edn, Academic Press, San Diego.

Roberts, J & Tucker, G 2000, *Plant hormone protocols: methods in molecular biology*, Humana Press, Totowa, New Jersey.

(ISBN 0 89603 577 8)

Sakurai, A, Yokota, T & Clouse, SD 1999, *Brassinosteroids steroidal plant hormones*, Springer, New York.

(ISBN 4 431 70214 8)

Sanita, L & Pawlik-Skowronska, B 2003, *Abiotic stresses in plants*, Kluwer Academic Publishers, Dordrecht.

(ISBN 1 4020 1648 4)

Waisel, Y et al. (eds) 2002, *Plant roots: the hidden half*, 3rd edn, Marcel Dekker, New York.

STUDENT WORKLOAD REQUIREMENTS

ACTIVITY	HOURS
Examinations	3.00
Laboratory or Practical Classes	21.00
Private Study	62.00
Report Writing	50.00
Tutorials	24.00

ASSESSMENT DETAILS

Description	Marks out of	Wtg (%)	Due date
1.5HR RESTRICTED TEST	50.00	30.00	20 Jul 2009 (see note 1)
WRITTEN ASSIGNMENT	20.00	20.00	20 Jul 2009 (see note 2)
REPORTS ON PRACTICALS	20.00	20.00	20 Jul 2009 (see note 3)
1.5HR RESTRICTED EXAM	90.00	30.00	END S2 (see note 4)

NOTES

1. Examiner to advise details of the date of the Restricted 1.5hr test which will be held during the Residential School. Modules 1 and 2 to be tested.
2. Written assignment will be due during the Residential School. Examiner to advise due date.
3. Examiner will advise due dates for practical reports.
4. Examination dates will be available during the Semester. Please refer to the examination timetable when published. (Modules 3 & 4).

IMPORTANT ASSESSMENT INFORMATION

1 Attendance requirements:
It is the students' responsibility to attend and participate appropriately in all activities (such as lectures, tutorials, laboratories and practical work) scheduled for them, and to study all material provided to them or required to be accessed by them to maximise their chance of meeting the objectives of the course and to be informed of course-related activities and administration. To maximize their chances of satisfying the objectives of the practical component of the course, students should attend and actively participate in the laboratory sessions in the course.

2 Requirements for students to complete each assessment item satisfactorily:
To complete the assignment satisfactorily, students must obtain at least 50% of the marks available for the assignment. To complete the examination and test satisfactorily, students must obtain at least 50% of the marks available for the examination and test. To complete the practical component satisfactorily, students must submit all practical reports and obtain at least 50% of the marks available.

3 Penalties for late submission of required work:
If students submit assignments after the due date without (prior) approval of the examiner then a penalty of 5% of the total marks gained by the student for the assignment may apply for each working day late up to ten working days at which time a mark of zero may be recorded.

4 Requirements for student to be awarded a passing grade in the course:
To be assured of receiving a passing grade a student must achieve at least 50% of the total weighted marks available for the course.

5 Method used to combine assessment results to attain final grade:
The final grades for students will be assigned on the basis of the weighted aggregate of the marks obtained for each of the summative assessment items in the course.

6 Examination information:
In a Restricted Examination, candidates are allowed access to specific materials during the examination. The only materials that candidates may use in the restricted examination for this course are: writing materials (non-electronic and free from material which could give the student an unfair advantage in the examination); calculators which cannot hold textual information (students must indicate on their examination paper the make and model of any calculator(s) they use during the examination; Students whose first language is not English, may, take an appropriate unmarked non-electronic translation dictionary (but not technical dictionary) into the examination. Dictionaries with any handwritten notes will not be permitted. Translation dictionaries will be subject to perusal and may be removed from the candidate's possession until appropriate disciplinary action is completed if found to contain material that could give the candidate an unfair advantage.

7 Examination period when Deferred/Supplementary examinations will be held:
Any Deferred or Supplementary examinations for this course will be held in the fourth week of the semester following this course offering and the examiner will advise students involved in writing of the date time and location of any examination.

8 University Regulations:
Students should read USQ Regulations 5.1 Definitions, 5.6. Assessment, and 5.10 Academic Misconduct for further information and to avoid actions which might contravene University Regulations. These regulations can be found at the URL http://www.usq.edu.au/corporateservices/calendar/part5.htm or in the current USQ Handbook.

ASSESSMENT NOTES

9 The due date for an assignment is the date by which a student must despatch the assignment to the USQ. The onus is on the student to provide proof of the despatch date, if requested by the Examiner. Students must retain a copy of each item submitted for assessment. This must be produced within five days if required by the Examiner.

10 Students who obtain an overall passing mark, but who did not perform satisfactorily in an examination, may, at the discretion of the examiner, be granted a supplementary examination. Students will be granted a deferred examination only if they perform satisfactorily in all other assessment items.

11 In order to attend laboratory classes, students must provide and wear appropriate personal protective equipment. This shall include a laboratory coat, closed in shoes, and safety glasses. Such equipment must be approved by supervising staff. Failure to provide and wear the appropriate safety equipment will result in students being excluded from classes.