

## MODULE DESCRIPTOR

<b>MODULE TITLE</b>	Plant Cell Biology		
<b>MODULE CODE</b>	MR1211	<b>CREDIT VALUE</b>	10 Credits
<b>MODULE DELIVERY</b>	Semester		
<b>MODULE TUTOR</b>	Julie Smith		
<b>DATE APPROVED</b>	April 2008	<b>VERSION NUMBER</b>	1
<b>DEPARTMENT</b>	School of Built & Natural Environment	<b>PARTNER INSTITUTION</b>	Myerscough College

### RELATIONSHIP WITH OTHER MODULES

<b>Co-requisites</b>	None	<b>Pre-requisites</b>	None	<b>Excluded Combinations</b>	None
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### MODULE AIMS

Increasingly research into the biochemistry and intracellular functioning of plants is giving us insights into new management practices and allowing us to produce new and useful plant varieties. This module aims to give students a basic knowledge of plant biochemistry and cell function to allow them to start to interpret these new developments.

The module will also help the development of statistical skills and give students experience of using a range of laboratory equipment.

### MODULE CONTENT

#### 1 Plant Chemistry

- 1.1 Elements of life
- 1.2 Atoms, Atomic number and weight
- 1.3 Energy levels, electron orbits, covalent bonds, ionic bonds and hydrogen bonds
- 1.4 pH and buffers, redox reactions, solutions and solvents
- 1.5 Carbohydrates, Lipids and Proteins (including enzymes)
- 1.6 DNA, RNA and the genetic code
- 1.7 Gene expression and protein synthesis
- 1.8 Biochemistry of photosynthesis and respiration

#### 2 Plant Cell Function and Division

- 2.1 Functions and interactions of cell organelles
- 2.2 Mitosis, meiosis, chromosomes and genes
- 2.3 Haploidy, diploidy, polyploidy, crossing over, mutations

#### 3 Genetics

- 3.1 Laws of inheritance
- 3.2 Monohybrid and Dihybrid crosses
- 3.3 Chi squared test

## LEARNING OUTCOMES

On successful completion of this module a student will be able to:

1	Describe the role and structure of the major organic molecules found in plants.
2	Explain the functions and interactions of cell organelles during plant growth and development.
3	Describe the processes of photosynthesis and respiration
4	Explain the genetic control of plant growth including transcription and translation

## TEACHING AND LEARNING STRATEGY

The module will be delivered either by a series of lectures, seminars, workshops and practicals to develop scientific investigation skills and approaches, or formatted as a sequenced series of online interactive lecture materials.

For online delivery sample results from laboratory experiments will be presented for analysis and discussion. Regular use will be made of formative, diagnostic self assessment tests. Online students will be encouraged to participate in on-line discussion forums.

## INDICATIVE CLASS CONTACT

1 hour lecture per week (12 weeks x 1 hour) plus **either** a 2 hour practical (6 weeks x 2 hours) **or** 1 hour workshop/seminar per week (6 weeks x 1 hour).

For on-line distance learning, module tutor time equivalent to 2 hours per week is allocated to support students. On-line students also have 24 hour access to a wide range of on-line learning materials and learning activities.

## INDICATIVE ASSESSMENT

*The assessment strategy for this module is designed to test all the learning outcomes. Students must demonstrate successful achievement of these learning outcomes to pass the module.*

Number of Assignments	Assessment	Weighting %	Type/Duration/ Wordcount (indicative only)	Learning Outcomes being assessed
Several	Frequent (4) short tests	50%	Short multiple choice tests 20 minutes each	1, 2, 3 & 4
1	Write up of practical work	50%	Laboratory notebook no more than 1500 words	1, 2, 3 & 4

## MODULE PASS REQUIREMENTS

For successful completion of the module, each individual element of assessment must be passed at 40%.

## **BIBLIOGRAPHY AND LEARNING SUPPORT MATERIAL**

Allaby, M. (2004) *A Dictionary of Plant Sciences*. 2<sup>nd</sup> Edition Oxford University Press

Beard, J.B. (1973) *Turfgrass Science and Culture*. Prentice-Hall

Campbell, N.A. Reece, J.B. Molles, M. Urry, L.A. & Heyden, R. (2005) *Biology*. 7<sup>th</sup> Edition Benjamin Cummings

Capon, B. (1990) *Botany for Gardeners: An Introduction and Guide*. Batsford

Clegg, C.J. & Mackean, D.G. (2000) *Advanced Biology*. 2<sup>nd</sup> Edition John Murray

Jones, M. & Jones, G. (1997) *Advanced Biology*. 2<sup>nd</sup> Edition Cambridge

Pallardy, S.G. (2008) *Physiology of Woody Plants, 3<sup>d</sup> edition*. San Diego, California: Academic Press

Lack, A.J. & Evans, D.E. (2001) *Plant Biology*. Oxford: Bios Scientific

Mauseth, J.D. (2003) *Botany: An Introduction to Plant Biology, 3<sup>d</sup> edition*. Jones and Bartlett, London

Ridge, I. (2002) *Plants*. Oxford University Press

Salisbury, F.B. & Ross, C.W. (1991) *Plant Physiology*. Belmont, California: Wadsworth

### **OTHER PUBLICATIONS**

Journal of Arboriculture

Journal of Horticultural Science and Biotechnology

Journal of Turfgrass Science

New Phytologist

Plant Physiology

The Plant Cell

### **USEFUL WEBSITE**

[hcs.osu.edu/hcs300/](http://hcs.osu.edu/hcs300/)