

SUMMARY OF INFORMATION ON EACH COURSE

1.	Name of Course	Cell and Function							
2.	Course Code	PCF0145							
3.	Status of Course [Applies to (cohort)]	Core for Foundation in Life Sciences							
4.	MQF Level/Stage Note : Certificate – MQF Level 3 Diploma – MQF Level 4 Bachelor – MQF Level 6 Masters – MQF Level 7 Doctoral – MQF Level 8	Foundation (Certificate – MQF Level 3)							
5.	Version (State the date of the Senate approval – history of previous and current approval date)	Date of previous version: October 2011 Date of current version: June 2014							
6.	Pre-Requisite	None							
7.	Name(s) of academic/teaching staff	Radziah Shaikh Abdullah, Leonard Yew Chi Boon							
8.	Semester and Year offered	Trimester 1							
9.	Objective of the course in the programme : To expose students to fundamental concepts in biology and helps students build knowledge of the core concepts in Biology at the cellular level with emphasis on the structure and function of cells in biological systems.								
10.	Justification for including the course in the programme :								
11.	Course Learning Outcomes :	Domain	Level						
	LO1	Cognitive	Level 1						
	LO2	Cognitive	Level 2						
	LO3	Cognitive	Level 2						
	LO4	Cognitive	Level 2						
12.	Mapping of Learning Outcomes to Programme Outcomes :								
	Learning Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8
	LO1	x	x						
	LO2	x	x						
	LO3	x	x						
LO4	x	x							
13.	Assessment Methods and Types :								
	Method and Type	Description/Details					Percentage		
	1 Quiz	Quizzes with short structured questions					10		
	2 Assignment	Assignments with short structured questions					10		
	3 Lab Reports	Lab reports with short structured questions					10		
	4 Test	Written examination					20		

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	5 Final Examination	Written examination			50
14.	Mapping of assessment components to learning outcomes (LOs)				
	Assessment Components	LO1	LO2	LO3	LO4
	Assessment 1		10	17	
	Assessment 2	12.5	10		
	Assessment 3		10		
	Assessment 4	25	20		
	Assessment 5	62.5	50	83	100
15.	Details of Course				
	Topics	Mode of Delivery (eg : Lecture, Tutorial, Workshop, Seminar, etc.) Indicate allocation of SLT (lecture, tutorial, lab) for each subtopic			
		Lecture	Tutorial	Lab	
	1 Introduction to biology: evolution and ecology Diversity of life. Concept of unity of life. Importance of biological diversity. Systematics and phylogeny. Descent with modification and natural selection. Speciation. An overview of ecology. Ecology as a scientific study. A hierarchy of interactions. Abiotic factors of the biosphere. Population and community ecology.	5	1		
	2 Essential chemistry for biology The fundamental building blocks. Atoms, molecules, elements and compounds. Chemical bonding and molecules. Chemical reactions. The structure of water. Properties of water as vital constituent of life. Acids, Bases and pH. Organic molecules. Carbohydrates. Lipids. Proteins. Nucleic acids: DNA and RNA. Biocatalyst – enzymes.	4	1		

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<p>3 Cell structure and organelles Prokaryotic cell. Eukaryotic cell: animal and plant cell. Cell wall and cell membrane. Transport across membrane. Organelles – nucleus, endoplasmic reticulum, Golgi body, mitochondrion, lysosome, ribosome, chloroplast, cytoskeleton, centriole and vacuole. Specialized cells – animal cells: epithelium, nerve, muscle cells; bone, cartilage and blood. Techniques in cytology. Microscopy: light and electron microscopy. Centrifugation</p>	5	2	4
<p>4 Cellular respiration Energy flow and chemical cycling in the biosphere. Some basic energy concepts. ATP and cellular work. Aerobic respiration. Glycolysis. Krebs cycle. Electron transport chain. Anaerobic respiration: fermentation.</p>	4	1	2
<p>5 Photosynthesis The basics of photosynthesis. The light dependent reaction. The light independent reaction – Calvin cycle. Adaptation of C₃, C₄ and CAM plants. Greenhouse effect.</p>	4	1	2
<p>6 Gaseous exchange and its control In human: structure of alveolus, adaptation of lungs for gaseous exchange, structure of hemoglobin, oxygen transport and carbon dioxide transport in blood. In plants: stomata, structure and function of guard cells, regulation of stomatal opening and closing.</p>	4	1	2
<p>7 Fluid transport In human: the heart structure and function, mechanism of heart beat, electrocardiography, lymphatic system, cardiovascular disease. In plants: xylem, transpirational pull, cohesion, tension, root pressure, phloem, transport of organic products by translocation.</p>	5	1	

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	8 Homeostasis Concepts of homeostasis. Negative and positive feedback mechanism. Structure and function of liver. Structure and function of kidney. Water concentration regulation in plants. Significance of transpiration.	4	1	
	9 The nervous system Organization of nervous system. Autonomic nervous system (ANS). Sympathetic and parasympathetic nervous system. Drug abuse junction. Definition and types of drugs – stimulant, depressant, hallucinogen, tranquilizer and inhalant.	4	1	
	10 Hormone In human: endocrine system, types and characteristics of hormones, mechanism of hormone action. In plant: types and functions of hormone (plant growth regulators e.g. auxin, gibberellin, cytokinins, abscisic acid, ethylene), phytochrome and the effects of light on plant development	3	1	
	Total Student Learning Time (SLT)	Face to Face / Guided Learning		Independent Learning
	Lecture	42		42
	Tutorials	11		11
	Laboratory/Practical	10		5
	Presentation	0		0
	Assignment	-		10
	Mid Term Test	1		4
	Final Exam	2		20
	Quizzes	2 times		2
	Sub Total	66		94
	Total SLT	160		
16.	Credit Value	4		
17.	Reading Materials :			
	Textbooks			
	Reece, J.B., Taylor, M.R., Simon, E.J., & Dickey, J.L. (2012). <i>Campbell Biology: Concepts and Connections</i> (7 th Ed). Pearson Benjamin Cummings.			

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Reference Material (including 'Statutes' for Law)

Audesirk, T., Audesirk, G., & Byers, B.E.(2014). *Biology: Life on Earth with Physiology* (10th Ed). Pearson/Prentice Hall.

Enger, E.D., Ross, F.C., & Bailey, D.B.(2012). *Concepts in Biology* (14th Ed).

Hoefnagels, M. (2012). *Biology: Concepts and Investigations* (2nd Ed). McGraw-Hill.

Krogh, D. (2014). *Biology: A Guide to the Natural World* (5th Ed). Pearson Benjamin Cummings.

Mader, S.S., & Windelspecht, M. (2012). *Essentials of Biology* (3rd Ed). McGraw-Hill.

- Appendix (to be compiled when submitting the complete syllabus for the programme) :
1. Mission and Vision of the University and Faculty
 2. Programme Objectives or Programme Educational Objectives
 3. Programme Outcomes (POs)
 4. Mapping of POs to the 8 MQF domain
 5. Summary of the Bloom's Taxonomy's Domain Coverage in all the Los in the format below :

Subject	Learning Outcomes (please state the learning Outcomes)	Bloom's Taxonomy Domain		
		Affective	Cognitive	Psychomotor
ABC1234	Learning Outcome 1			
	Learning Outcome 2			
	Learning Outcome 3			
	Learning Outcome 4			
DEF5678	Learning Outcome 1			
	Learning Outcome 2			
	Learning Outcome 3			
	Learning Outcome 4			

6. Summary of LO to PO measurement
7. Measurement and Tabulation of result for LO achievement
8. Measurement Tabulation of result for PO achievement