

SUMMARY OF INFORMATION ON EACH COURSE

1.	Name of Course	Cellular Reproduction and Genetics							
2.	Course Code	PCG0245							
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 2							
9.	Objective of the course in the programme : To expose students to fundamental concepts in biology and helps students build knowledge of the core biological concepts comprising the topics of cellular reproduction and genetics								
10.	Justification for including the course in the programme :								
11.	Course Learning Outcomes :	Domain	Level						
	LO1	Cognitive	Level 2						
	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	16.7	16.7	
	Assessment 2	10			14.3
	Assessment 3	10			14.3
	Assessment 4	20			
	Assessment 5	50	83.3	83.3	71.4
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 Cellular basis of reproduction and inheritance The concept of cell division. The cell cycle. Mitosis. Meiosis. Cytokinesis. The origins of genetic variation.	4	1	2	
	2 Genetic inheritance Mendel's genetics. Mendel's principles. Monohybrid cross. Dihybrid cross. Variations on Mendel's principles – codominancy, incomplete dominancy, multiple alleles, lethal gene, polygenic inheritance and linked genes. Sex chromosomes and sex-linked genes. Pedigree analysis. Genetic mapping.	8	2	4	
	3 Population genetics Gene pool concept. Gene pool and allele frequency. Hardy-Weinberg Law. Hardy-Weinberg equations.	3	1	2	

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<p>4 Molecular biology of the gene DNA structure – Watson and Crick model. DNA as the carrier of genetic information. Replication of DNA. Protein synthesis from the nucleotide sequence. Transcription. Translation. Gene regulation in bacteria. Lactose Operon. Regulation of eukaryotic gene expression. Regulation of embryonic development. Gene activation and cell signaling. The genetic basis of cancer.</p>	7	2	
<p>5 Mutation Spontaneous and induced mutation. Types of mutation. Genetic mutation – base substitution, insertions, deletions and inversion. Chromosomal mutation. Chromosome aberration. Alterations of chromosome number – aneuploidy, polyploidy and euploidy.</p>	3	1	
<p>6 DNA technology Recombinant DNA technology. Restriction enzyme. Vector. Host cell. Genetic engineering – cloning. Genomic library and gene bank. Application of recombinant DNA technology. More tools of DNA technology – reverse transcriptase, nucleic acid probes, automated synthesis and sequencing, gel electrophoresis, restriction fragment analysis and polymerase chain reaction. The human genome project. Other applications – genetic screening, gene therapy and DNA fingerprinting. Risks and ethical questions. The controversy about GM foods.</p>	7	2	

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<p>7 Reproduction and development Asexual reproduction in plants and animals. Sexual reproduction in plants. Reproductive organ in plants. Gamete formation. Pollination. Fertilization. Growth and development in plant. Formation and development of seed. Seed germination. Human reproductive system. Male reproductive system. Spermatogenesis. Female reproductive system. Oogenesis. Roles of hormones. Fertilization. Fetal development. Hormonal changes during pregnancy. Role of hormones in parturition and birth process. Role of hormones in lactation.</p>	7	2	2
<p>8 Growth Growth phases. Methods of measuring growth. Parameters. Types of growth curves. Patterns of growth. Ecdysis and metamorphosis. Seed dormancy, hibernation, aestivation and diapauses.</p>	2	1	
<p>Total Student Learning Time (SLT)</p>	Face to Face / Guided Learning		Independent Learning
Lecture	41		41
Tutorials	12		12
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