

1.	Name of Course/Module	Basic Human Genetics
2.	Course Code	HHG1019
3.	Status of Subject	Core for B. Sc Bioinformatics
4.	MQF Level/Stage	Bachelor Degree – MQF Level 6
5.	Version (state the date of the last Senate approval)	June 2012
6.	Requirement for Registration	HCB1019 Cell Biology
7.	Name(s) of academic/teaching staff	Leila Hilout Cheong Soon Fatt Ong Chia Sui
8.	Semester and Year offered	Trimester 2 (Gamma level)
9.	Objective of the course/module in the programme :	
	<ol style="list-style-type: none"> 1. To introduce the students to the principles of human genetics 2. To provide an understanding of the fundamental concepts in genetics 3. To provide an overview of gene testing for mutations 	
10.	Learning Outcomes :	
	<p>At the completion of the subject, students should be able to:</p> <p>LO1: Grasp and explain the basic principles in human development, gene inheritance and genetic variations (Cognitive, Level 2)</p> <p>LO2: Comprehend the basic principles in genetic polymorphism, mutations and population genetics. (Cognitive, Level 2)</p> <p>LO3: Comprehend and explain the molecular basis of common diseases and cancers. (Cognitive, Level 2)</p> <p>LO4: Outline the various strategies and approaches in genetic testing, disease prevention through molecular techniques, gene therapy and gene cloning. (Cognitive, Level 3)</p>	
11.	Synopsis:	
	<p>The course covers various aspects of human development; the structure and function of human genome; patterns of gene inheritance; human population genetics; genetic variation, polymorphism and mutation; molecular genetics of common diseases; genetics of cancer; approaches to genetic testing; gene therapy; gene cloning; various methods of disease prevention.</p>	
	<p>Kursus ini merangkumi pelbagai aspek dalam pembangunan manusia, struktur dan fungsi genom manusia, corak pewarisan gen, genetik populasi manusia, variasi genetik, polimorfisma dan mutasi, genetik molecular bagi penyakit yang umum, kanser genetik, cara cubaan genetik, terapi gen, pengklonana gen dan pelbagai cara dalam mencegah penyakit.</p>	
12.	Mapping of Subject to Programme Outcomes :	
	Programme Outcomes	% of Contribution
	PO1: Apply soft skills in work and career related activities	33.33

	PO2: Demonstrate knowledge and understanding of fundamental concepts, principles and best practices	66.67	
13.	Assessment Methods and Types :		
	Method and Type	Description/Details	Percentage
	Test		10%
	Quiz		20%
	Assignment	Report & Presentation	10%
	Lab reports		10%
	Final Exam		50%
14.	Details of Subject		
	Topics	Mode of Delivery	
		Lecture	Tutorial
	1. Human Development <ul style="list-style-type: none"> • Meiosis • Gamete maturation • Prenatal development • Maturation and aging 	2	-
	2. The Human Genome <ul style="list-style-type: none"> • Structure of the chromosome • DNA structure and function • Classes of DNA in the human genome • Gene structure and organization • Gene regulation and expression • Coordinated gene expression • Transcription of DNA • Translation and Genetic Code • Genetic mutation/Mechanism of disease 	5	1
	3. Patterns of Single Gene Inheritance <ul style="list-style-type: none"> • Autosomal inheritance • Sex linked inheritance • Phenotypic expression • Non-classical patterns of inheritance • Molecular pathology of single gene disorders 	3	1
	4. Multifactorial Inheritance	1	-
	5. Human Population Genetics <ul style="list-style-type: none"> • Phenotypes, genotypes and gene frequencies • Hardy-Weinberg equilibrium • Human mutation rates 	2	-
	6. Genetic Variation, Polymorphism and Mutation	2	1

	<p>7. Molecular genetics of common Diseases</p> <ul style="list-style-type: none"> • General approach to study polygenic diseases • Diabetes • Autoimmune diseases • Cardiovascular diseases • Neuro-psychiatric diseases • Hereditary variability in response to drugs • Infectious disease • Allergy and atopy 	3	1
	<p>8. Cancer</p> <ul style="list-style-type: none"> • Tumour viruses and oncogenes • Cancer suppressor and anti-oncogenes • Rare genetic disorders that predispose towards cancer 	3	1
	<p>9. Approach to Gene Testing</p> <ul style="list-style-type: none"> • Cytogenetics • Molecular cytogenetics • Molecular genetics • Cancer genetics <p>10. Prevention of Disease</p> <ul style="list-style-type: none"> • Prenatal diagnosis • Postnatal testing • Genetic counseling • Ethical issues 	3	-
	<p>11. Gene Therapy</p> <p>12. Gene Cloning</p> <ul style="list-style-type: none"> • Approach • Ethical issues 	2	1
	Total	26	6
15.	Laboratory		
	Lab 1 ABH Secretor test		
	Lab 2 Mendelian patterns of inheritance and Population genetics		
	Lab 3 Mendelian genetics of Corn		
	Lab 4 Bioinformatics analysis of human genetics diseases		
16.	Total Student Learning Time (SLT)	Face to Face (Hour)	Total Guided and Independent Learning
	Lecture	26	26
	Tutorials	6	6
	Laboratory/Practical	12	6
	Presentation	-	-
	Assignment	-	10
	Mid Term Test (1)	1	5

	Final Exam	2	20
	Quiz	4 times	4
	Sub Total	47	77
	Total SLT	124/40 = 3.1 => 3	
17.	Credit Value	3	
18.	Reading Materials :		
	Textbook	Reference Materials	
	1. Human Genetics – Concepts and Applications. 9 th Edition. Ricki Lewis. WCB/McGraw Hill, 2010.	1. Human Heredity: Principles and Issues. 9 th Edition. Michael Cummings. BOOKS/COLE, Cengage Learning, 2009	
19.	Appendix (to be compiled when submitting the complete syllabus for the programme) :		
	<ol style="list-style-type: none"> 1. Mission and Vision of the University and Faculty 2. Mapping of Programme Objectives to Vision and Mission of Faculty and University 3. Mapping of Programme Outcome to Programme Objectives 4. Programme Objective and Outcomes (Measurement and Descriptions) 		