

SUMMARY OF INFORMATION ON EACH COURSE

1.	Name of Course	Basic Microbiology								
2.	Course Code	HMM 1011								
3.	Status of Course [Applies to (cohort)]	Specialisation core for B. Sc (Hons) Bioinformatics								
4.	MQF Level/Stage	Bachelor – MQF Level 6								
5.	Version (State the date of the Senate approval – history of previous and current approval date)	Date of previous version :			April 2014					
		Date of current version:			June 2014					
6.	Pre-Requisite	None								
7.	Name(s) of academic/teaching staff	Ong Chia Sui Leonard Yew Chi Boon								
8.	Semester and Year offered	Trimester 2, Year 2								
9.	Objective of the course in the programme : 1. To provide basic knowledge on the basic properties of pathogenic microbes including their cellular and molecular structure, microbial replication and growth 2. To introduce the principles underlying the detection and identification of microorganisms 3. To introduce the principles underlying the mechanisms of infectious diseases									
10.	Justification for including the course in the programme : This subject provides fundamental knowledge about microorganisms in terms of their diversity, growth and functions, as well as their roles in our life.									
11.	Course Learning Outcomes :	Domain	Level							
	LO1 Grasp and state the fundamental knowledge on the structure, metabolism, life cycle and taxonomy of microorganisms.	Cognitive	Level 2							
	LO2 Comprehend the principles of microbial growth control.	Cognitive	Level 2							
	LO3 Describe the mechanism of infectious diseases and host response.	Cognitive	Level 2							
	LO4 Perform preliminary identification of bacteria through light microscopy and basic laboratory tests.	Cognitive	Level 3							
12.	Mapping of Learning Outcomes to Programme Outcomes :									
	Learning Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
	LO1		x							
	LO2		x							
	LO3		x							
	LO4	x	x							

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13.	Assessment Methods and Types :					
	Method and Type	Description/Details			Percentage	
	Final exam				50%	
	Tests (Quizzes and Midterm test)				30%	
	Assignment				10%	
	Lab Reports				10%	
14.	Mapping of assessment components to learning outcomes (LOs)					
	Assessment Components	%	LO1	LO2	LO3	LO4
	Final Exam	50	55.6	55.6	33.3	
	Tests (Quiz and Midterm test)	30	33.3	33.3	33.3	
	Assignment	10			33.3	
	Lab Reports	10	11.1	11.1		100
15.	Details of Course					
	Topics			Mode of Delivery		
				Lec	Tut	Lab
	1. Introduction: The microbial world and you			1	-	3
	2. Observing microorganisms through a microscope			1	-	6
	3. Prokaryotic cell structure and morphology •Structures external to the cell wall •Cell wall •Structures internal to the cell wall			2	1	-
	4. Microbial metabolism •Catabolic and anabolic reactions •Enzymes •Energy production •Carbohydrate catabolism			2	-	3

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	5. Growth and death of microorganisms	2	1	3			
	<ul style="list-style-type: none"> •Requirement for microbial growth •Culture media •Obtaining pure culture •Preserving bacterial cultures •The growth of bacterial cultures 						
	Control of microbial growth	2	-	3			
	<ul style="list-style-type: none"> •The rate of microbial death •Actions of microbial control agents •Physical methods of microbial control •Chemical methods of microbial control 						
	6. Classification of microorganism				2	-	-
	<ul style="list-style-type: none"> •The study of phylogenetic relationship of the 3 domains Bacteria, Archaea and Eukarya •Classification of organisms •Methods of classifying and identifying microorganisms 						
	7. The Prokaryotes-domain Bacteria and Archaea						
	<ul style="list-style-type: none"> •Features of selected prokaryotes 	2	1	-			
	8. The Eukaryotes – Fungi and Algae	2	-	-			
	<ul style="list-style-type: none"> •Characteristics of fungi •Fungal diseases •Characteristics of algae •Roles of algae in nature 						
	9. Viruses, Viroids and Prions						
<ul style="list-style-type: none"> •General characteristics •Structure •Growth and reproduction •Virus infection 							
10. Interaction between microbe and host	6	1	-				
<ul style="list-style-type: none"> •Principles of disease and epidemiology •Microbial mechanisms of pathogenicity •Innate immunity •Adaptive immunity 							
11. Environmental and applied microbiology							
<ul style="list-style-type: none"> •Environmental microbiology •Applied and industrial microbiology 	2	-	-				
Total	26	4	18				
16. Laboratory							

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	<p>Lab 1 Microscopy •Use and care of the microscope •Examination of living organism •Types of microscopes</p>		
	<p>Lab 2 Staining Methods •Preparation of smears and simple staining •Negative staining •Gram staining</p>		
	<p>Lab 3 Cultivation of Bacteria •Microbes in the environment •Transfer of bacteria: Aseptic techniques •Isolation of bacteria by dilution techniques •Special media for isolating bacteria</p>		
	<p>Lab 4 Microbial Metabolism •Carbohydrate catabolism •Protein catabolism •Respiration •Rapid Identification method</p>		
	<p>Lab 5 Microbial Growth •Oxygen and growth of bacteria •Role of temperature</p>		
	<p>Lab 6 Control of Microbial Growth •Physical method of control: Heat •Physical method of control: UV radiation •Chemical method of control: Disinfectant and antiseptic •Chemical method of control: Antimicrobial drug</p>		
	Total Student Learning Time (SLT)	Face to Face / Guided Learning	Independent Learning
	Lecture	26	26
	Tutorials	4	4
	Laboratory/Practical	18	9
	Assignment	-	10
	Mid Term Test	1	3

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	Final Exam	2	15
	Quizzes	2 times	2
	Sub Total	51	69
	Total SLT	120	
17.	Credit Value	3	
18.	Reading Materials :		
	Textbooks		
	Tortora, Funke and Case. (2013). Microbiology: an introduction. 11th Edition. Pearson, Benjamin Cummings.		
	Reference Material (including 'Statutes' for Law)		
	Robert W. Bauman (2014). Microbiology with diseases by taxonomy. 4th Edition. Benjamin Cummings.		

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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