

**SUMMARY OF INFORMATION ON EACH COURSE**

1.	Name of Course	Introductory Course in Pharmacology								
2.	Course Code	HPC2011								
3.	Status of Course	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 : June 2012 Date of current version : June 2015								
6.	Pre-Requisite	HAP1011 Human Anatomy and Physiology & HCB1011 Cell Biology								
7.	Name(s) of academic/teaching staff	Mr Cheong Soon Fatt Madam Amelia Kassim Ms Teo Poh Nee								
8.	Semester and Year offered	Trimester 2, Year 3								
9.	Objective of the course in the programme :	To introduce the principles of pharmacology with focus on the metabolism, distribution and the mechanism of drug action								
10.	Justification for including the course in the programme :	The course will introduce students to the principles of drug action. Students will be exposed to the action of drugs at various drug targets (Receptors, Enzymes, and Ion Channels), the routes of administration of drugs, the absorption and distribution, the metabolism and elimination and the factors that influence individual response to drug. The laboratory sessions will cover various aspects of computer aided drug design.								
11.	Course Learning Outcomes :									
	LO1 Describe how drugs are absorbed, distributed, metabolized and eliminated									
	LO2 Understand the principles of drug action at the cellular level									
	LO3 Understand the effects of drugs on body systems									
	LO4 Understand the method of computer aided drug design									
12.	Mapping of Learning Outcomes to Programme Outcomes :									
	Learning Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
	LO1	X	X							
	LO2	X	X							
	LO3	X	X							
13.	Assessment Methods and Types :									
	Method and Type	Description/Details						Percentage		
	Final Exam	Written examination						50		
	Tests (Quiz and Midterm test)	Written examination						30		
	Assignment	Report & Presentation						10		
Lab	Lab reports						10			
14.	Mapping of assessment components to learning outcomes (LOs)									
	Assessment Components	Percentage	LO1	LO2	LO3	LO4				
	Final Exam	50	55.6	50	55.6					
	Tests (Quiz and Midterm test)	30	33.3	30	33.3	60				
	Assignment	10	11.1	10	11.1	20				
Lab Reports	10		10		20					

**SUMMARY OF INFORMATION ON EACH COURSE**

15.	<b>Details of Subject:</b>			
	Topics	Mode of Delivery		
		Lec	Tut	Lab
	<b>1. Introduction –</b> <ul style="list-style-type: none"> <li>Overview, Nomenclature and Classification of Drugs</li> </ul>	1		
	<b>2. General Principles of Drug Action:</b> <ul style="list-style-type: none"> <li>The binding of drug molecules to cells</li> <li>Desensitization and tachyphylaxis</li> </ul>	1		2
	<b>3 How Drugs Act: Molecular Aspects</b> <ul style="list-style-type: none"> <li>Targets for drug action</li> <li>Receptors</li> <li>Ion channels</li> <li>Enzymes</li> <li>Nucleic acids</li> </ul>	4		2
	<b>4. Cellular Mechanisms: Excitation, Contraction and Secretion</b> <ul style="list-style-type: none"> <li>Regulation of Intracellular calcium levels</li> <li>Excitation</li> <li>Muscle contraction</li> <li>Release of chemical mediators</li> <li>Epithelial ion transport</li> </ul>	2		2
	<b>5. Cellular Mechanism: Cell Proliferation, and Apoptosis</b> <ul style="list-style-type: none"> <li>Cell proliferation</li> <li>Angiogenesis</li> <li>Apoptosis and cell removal</li> <li>Pathophysiological implications</li> <li>Therapeutic implications</li> </ul>	2	1	
	<b>6. Absorption and Distribution of Drugs</b> <ul style="list-style-type: none"> <li>Translocation of drug molecules</li> <li>Drug disposition</li> <li>Drug absorption</li> <li>Special drug delivery systems</li> <li>Concept of Volume of Distribution, Clearance and T<sub>1/2</sub></li> </ul>	3		2
<b>7. Drug Metabolism, Elimination, Pharmacokinetics &amp; Pharmacodynamics</b> <ul style="list-style-type: none"> <li>Drug metabolism</li> <li>Renal excretion of drugs and drug metabolites</li> <li>Biliary excretion and enterohepatic circulation</li> </ul>	3	1		
<b>8. Factors that influence the Patient Response to a Drug</b> <ul style="list-style-type: none"> <li>Adverse Drug Reactions</li> </ul>	1		2	

**SUMMARY OF INFORMATION ON EACH COURSE**

	<b>9. Chemical Mediators and the</b> <ul style="list-style-type: none"> <li>Autonomic Nervous System</li> <li>Cholinergic Transmission</li> <li>Noradrenergic Transmission</li> </ul>	4		2
	<b>10. Chemical Mediators:</b> <ul style="list-style-type: none"> <li>Other Peripheral Mediators</li> <li>Peptides and Proteins as Mediators</li> <li>Nitric Oxide</li> <li>Local Hormones, Inflammation, and Immune Reactions</li> <li>Anti Inflammatory and Immunosuppressant Drugs</li> </ul>	3	1	
	<b>11. Action of Drugs on specific Organ Systems</b> <ul style="list-style-type: none"> <li>Cardiovascular, Renal</li> </ul>	2		2
	<b>12. Methods and Measurement in Pharmacology</b> <ul style="list-style-type: none"> <li>Bioassay</li> <li>Animal models of disease</li> <li>Clinical trials</li> <li>Balancing benefits and risks</li> </ul>	2		
	<b>Total</b>	<b>28</b>	<b>3</b>	<b>14</b>
	<b>Laboratory</b>			
	Lab 1 - Computer aided design- protein modification(SPDBV01) Lab 2 - Computer aided design-protein modification(SPDBV02) Lab 3 - BAC calculation Lab 4 - Homology modeling part 1 Lab 5 - Homology modeling part 2 Lab 6 - Protein/drug-ligand interaction- Autodock part 1 Lab 7 - Protein/drug-ligand interaction- Autodock part 2			
16.	<b>Total Student Learning Time (SLT)</b>	<b>Face to Face</b>	<b>Total Guided and Independent Learning</b>	
	Lecture	28	28	
	Tutorials	3	3	
	Laboratory/Practical	14	7	
	Assignment	4	12	
	Mid Term Test	-	-	
	Final Exam	2	20	
	Quizzes	3 times	3	
	Sub Total	51	73	
	<b>Total SLT</b>	<b>120</b>		
17.	Credit Value	<b>3</b>		
18.	<b>Reading Materials :</b>			
	Textbooks			

**SUMMARY OF INFORMATION ON EACH COURSE**

	Lippincott Illustrated Reviews: Pharmacology 6th edition (Lippincott Illustrated Reviews Series), Whalen K. ISBN-13: 978-1451191776 ISBN-10: 1451191774, LWW. 2014
	<b>Reference Material (including 'Statutes' for Law)</b>
	Pharmacology. 7th ed. Rang HP, Dale MM, Ritter JM & Moore PK. Churchill Livingstone, 2011.

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