Teaching Plan

Subject Planning for Semester 16172/IJA (SEMESTER 2 SESSION 2016/2017)

Subject	**CELL AND MOLECULAR BIOLOGY**
Subject Code	**BSB1163**
Credit Hours	3
Faculty	FAKULTI SAINS & TEKNOLOGI INDUSTRI
Passing Mark	40

Prerequisite

Equivalency
BSB2133
BSB2172

Synopsis
This course discusses fundamental concepts of cell biology, structure and function of cellular organelles and its their biomolecules. Emphasis will be given on compositions, structures and functions of cell membrane and concepts of cell division. The course also includes discussions on applications of cell biology such as cancer, pathogen infections and stem cells.Concepts of molecular biology, gene expressions and its control are also discussed. Brief introductions on techniques of molecular biology such as DNA/RNA extraction, polymerase chain reaction (PCR), and gene cloning also explained in this course.

Objective
1 Describe the principle of cell and molecular biology (C2)
2 Apply cell and molecular biology principle to solve related problems (C3)
3 Analyse cell structures, biological mechanisms and their related investigation techniques (C4)
4 Convey ideas clearly and effectively, as well as giving feedback on given topics (A2)

Contact Hour

Lecture	3
Tutorial	
Lab	

References

1 Karp, G. Cell and Molecular Biology 5th Edition John Wiley
2 Rastogi, S. C. Cell and Molecular Biology New Age International
3 Lodish, H. Molecular Cell Biology W. H. Freeman & Co.
4 Cooper, G. M. The Cell - a molecular approach Sinaeur Assoc. Inc.
5 Alberts, B. Molecular Biology of the Cell Garland Science

Assessment Plan

QUIZ 1	5 %
QUIZ 2	5 %
TEST 1	15 %
ASSIGNMENT	10 %
QUIZ 3	5 %
QUIZ 4	5 %
TEST 2	15 %
FINAL EXAM	40 %

Subject Planning

Week	Chapter	Topic	Assessment
1	1	Introduction to Cell Biology	
	1	The discovery of cell	

Teaching Plan

Week	Chapter	Topic	Assessment
		2 Basic properties of cells **3** Organelle **4** Microscopy	
2	**2**	Cell structure and function **1** Biomacromolecules **2** Classes of cells: prokaryotic cell and eukaryotic **3** Viruses	
3	**3**	Cell membrane **1** Overview of membrane functions and structure **2** Chemical composition of membranes **3** Membrane fluidity **4** Membrane potential **5** cell signaling	QUIZ 1 5%
4	**3**	Cell membrane function	
5	**4**	Transport across cell membrane **1** Membrane potential **2** Passive transport **3** Active transport	QUIZ 2 5%
6	**5**	Cell division **1** Cell cycle **2** Cytoskeleton **3** Cell junctions	TEST 1 15%
7	**6**	Applications in cell biology **1** Cancer and other diseases **2** Stem cells **3** Antibodies and vaccines **4** Cell products and detection	
8		MID SEMESTER BREAK	ASSIGNMENT 10%
9	**7**	Structure of genes and the nature of genome **1** Genes and chromosome **2** Chemical nature of the gene (DNA structure and supercoiling) **3** Structure of the genome **4** Stability of the genome	QUIZ 3 5%
10	**8**	Replication and repair of DNA **1** DNA replication **2** DNA repair	

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Week	Chapter	Topic	Assessment
11	9	Gene expression 1 Relationships between genes and proteins 2 mRNA transcription 3 Protein translation	
12	10	The control of gene expression 1 Control of gene expression in bacteria 2 Control of gene expression in eukaryotes 3 Control at transcriptional, processing, translational and post-translational levels	QUIZ 4 5%
13	11	Techniques in molecular biology 1 Nucleic acid extraction 2 Protein extraction 3 Gel electrophoresis 4 Polymerase chain reaction (PCR) 5 DNA sequencing	
14	12	Introduction to gene cloning 1 Vectors and hosts 2 Restriction enzymes 3 DNA ligation 4 DNA transformation 5 DNA hybridization	TEST 2 15%
15	12	Introduction to gene cloning	
16		Final Exam	FINAL EXAM 40%