

COURSE CONTENT

Course Code & Title	:	CY1001 Introductory Biology
Academic Unit	:	3 AU
Pre-requisite	:	None
Mutually Exclusive	:	CM1051, BS1001
Course Description	:	

CY1001 Introductory Biology

[Online interactive digital media (IDM)-based courseware with self-assessments: 24-28 hours depending on the background and proficiency of students; Tutorials designed for Team-based Learning: 12 hours]

Learning Objectives

This course aims

- (a) to provide the very basic understanding of biological principles from the molecular level up to its connection to the macrobiology level, with emphasis on the unifying nature of all life on Earth.
- (b) to instil a basic awareness of biology in relation to other disciplines such as physical, chemical sciences and engineering.

Content

This course introduces biology at a basic molecular level and brings into perspective the unifying theme of all living things. The relationship of the molecular principles to the macroscopic view of biology will be explained. Current advances in biology that has implications to other disciplines will be presented and discussed.

Course Outline

IDM-based online courseware structured into Learning Objects (LOs) will be posted on NTULearn according to the schedule shown, followed by a weekly one-hour tutorial.

Week	LO	Module : Content
1	1	Introduction 1: Orientation to the "study of life"
	2	Introduction 2: Basics from chemistry: elements of matter, water and buffer
2	3	Introduction 3: Origins of life & biological diversity (include virus)
	4	Introduction 4: The human body
3	5	Macromolecules 1: Introduction
	6	Macromolecules 2: Carbohydrates
	7	Macromolecules 3: Nucleic Acids
4	8	Macromolecules 4: Proteins
	9	Macromolecules 5: Lipids
5	10	Cells 1: The basic unit of life (Introduction)
	11	Cells 2: Prokaryotes

	12	Cells 3: Eukaryotes
6	13	Genetic basis of life 1: Introduction
	14	Genetic basis of life 2: The central dogma
	15	Genetic basis of life 2: Regulation of gene expression
	16	Genetic basis of life 4: Diversity within Population
7	17	Continuity of Life 1: DNA replication
	18	Continuity of Life 2: Cell division - Prokaryotes
	19	Continuity of Life 3: Cell division - Eukaryotes (cell cycle, mitosis, meiosis)
8	20	Continuity of Life 4: Concepts of asexual and sexual reproduction
	21	Continuity of Life 5: Reproduction at the macroorganism level
9	22	Mutation 1: Mendelian genetics vs Molecular genetics
	23	Mutation 2: Evolution
	24	Mutation 3: Molecular biotechnology
10	25	Metabolism 1: Bioenergetics
	26	Metabolism 2: Digestive system (extracellular metabolism)
11	27	Metabolism 3: Cellular metabolism
	28	Metabolism 4: Cellular respiration
	29	Metabolism 5: Metabolic integration
12	30	Perspectives 1: The era of “-Omics”
	31	Perspectives 2: Personalization of healthcare
	32	Perspectives 3: Beyond the discipline of Biology

Learning Outcomes

1. To understand the basics of biology at the “molecular level”
2. To appreciate the link of the molecular level to the macrobiology level
3. To appreciate the unifying theme of living things
4. To gain an awareness of the link of biology with other disciplines

Course Structure

1. Each LO comprises of approx. 25-40 min knowledge content interspersed with 15-20 min of self-check questions. Students are expected to go through the LOs that are posted on NTULearn at their own pace over a 1-week period.
2. Tutorials with team-based learning format will then follow.

Textbooks/References

Johanson et al, Essentials of the Living World (4th Edition), McGraw-Hill, International Edition (2012).

Mader et al, Biology (11th Edition), McGraw-Hill International Edition (2013).