

**INTI COLLEGE MALAYSIA****COURSE STRUCTURE****COURSE: BIO101 ESSENTIALS OF BIOLOGY, LAB (4 cr)****PREREQUISITE:**

None

**COURSE DESCRIPTION:**

This one-semester course is designed for non-science majors. It enables students to see the relevance of science in their everyday lives and appreciate how biology is woven throughout the fabric of their lives. This course introduces the scientific method and focuses on cells and metabolism, biodiversity and classification, the genetic basis of life, evolution, health and disease, as well as ecology and the environment. Laboratory work is used to illustrate some of the concepts covered in the lectures.

**LEARNING OBJECTIVES:**

The aims of this course are to enable students to:

- Identify biological facts and principles relating to cells and metabolism, biodiversity and classification, the genetic basis of life, evolution, health and disease, as well as ecology and the environment.
- Apply the biological knowledge learned in making conclusions from data, solving problems, and discussing issues faced by contemporary society.
- Acquire laboratory skills including proper handling and use of laboratory apparatus and materials.

**LEARNING OUTCOMES:**

Successful students will be able to:

- Apply general principles in biology related to cells and metabolism and biodiversity and classification.
- Describe the inheritance of traits and discuss some of the applications of genetic engineering.
- Evaluate the evidence supporting the evolutionary process and explain the role of natural selection and the concepts of species and race.
- Describe health and disease issues related to infectious agents and the immune system, gender, and brain structure and function.
- Discuss issues related to ecology, conservation biology and the ability of earth to support human population.
- Carry out some procedures and techniques for practical investigations and interpret the results by application of principles and theories.

**COURSE FORMAT:**

Lecture: 3 hr per week, Tutorial: 1 hr per week, Laboratory Work: 2 hr per week.

[For short semester, Lecture: 6 hr per week, Tutorial: 2 hr per week, Laboratory Work: 4 hr per week.]

**STUDENT EVALUATION:**

Test 1: 20%, Test 2: 20%, Assignments/Quizzes: 10%, Laboratory Work: 10%. Final Examination: 40%.

**FINAL EXAMINATION FORMAT:**

Duration: 3 hours

Section A (40 marks): Answer ALL FOURTY multiple-choice questions.

Section B (60 marks): Answer ALL the SIX to SEVEN structured-type questions.

**GRADING SCALE:**

A+ (90-100), A (85-89), A- (80-84), B+ (75-79), B (70-74), B- (65-69), C+ (60-64), C (55-59), C- (50-54), D+ (45-49), D (40-44), F (0-39)

**BASIC TEXT:**

Belk, CM & Borden, VM. Biology: Science for Life. 1<sup>st</sup> ed., Prentice Hall, 2004.

**REFERENCES:**

1. Campbell, NA, Reece, JB & Simon, EJ. Essential Biology. 2<sup>nd</sup> ed., Benjamin Cummings, 2004.
2. Krogh, D. Biology: A Guide to the Natural World. 3<sup>rd</sup> ed., Prentice Hall, 2005.
3. Audesirk, G, Audesirk, T & Byers, BE. Biology: Life on Earth. 7<sup>th</sup> ed., Prentice Hall, 2005.

**CLASS SYLLABUS:**

<b>Lecture(s)</b>	<b>Topics</b>
1 & 2	<b>Introduction To The Scientific Method</b> The process of science. Evaluating scientific information. Is there a cure for the common cold?
3 & 4	<b>Cells And Metabolism</b> Nourishing your body. Converting food into energy. Body fat and health.
5 & 6	<b>Biodiversity And Classification</b> The organization of life's diversity. Locating valuable species. Tools for the bioprospector.
7 & 8	<b>The Science Of Inheritance</b> The inheritance of traits. The role of genes in determining traits. Genes, environment and the individual.
9 & 10	<b>The Cell Cycle And Cell Division</b> What is cancer? Cell division. Diagnosis and treatment. Test 1
11 & 12	<b>DNA Structure And Replication</b> Chromosomes and DNA. DNA fingerprinting. <b>Meiosis</b> How DNA passes from parents to their children.
13 & 14	<b>Genetic Engineering</b> Genetic engineers. Genetic engineers can use bacteria to synthesize human proteins. Genetic engineers can modify food. Genetic engineers can modify humans.
15 & 16	<b>The Evidence For Evolution</b> What is evolution? Charles Darwin and the Theory of Evolution. Evaluating the evidence for evolution. Evaluating the hypotheses.
17 & 18	<b>Natural Selection</b> AIDS and HIV. The evolution of HIV. How understanding evolution can help prevent AIDS.
19 & 20	<b>Species And Races</b> All humans belong to the same species. The race concept in biology. Why human groups differ? The meaning of differences among human populations. Test 2
21 & 22	<b>Immune System, Bacteria And Viruses</b> Infectious agents. Epidemics. The body's response to infection. Preventing the spread of prion diseases.
23 & 24	<b>Developmental Biology, Reproductive Anatomy, And Endocrinology</b> The origin of biological sex differences. Sex differences that do not affect athleticism. Sex differences that affect athleticism. Culture affects athleticism.
25 & 26	<b>Brain Structure And Function</b> The nervous system. The brain. Neurons. The Environment and ADD.
27 & 28	<b>Ecology And Conservation Biology</b> The sixth extinction. The consequences of extinction. Saving species. <b>Can Earth Support The Human Population?</b> Is the human population too large? Feeding the human population.
	<b>Final Examination</b>

**LABORATORY WORK:**

1. Introduction To The Scientific Method
2. Nutrient Analysis Of Foods
3. Windows To A Microscopic World
4. Classification Of Living Things
5. Mitosis And Asexual Reproduction
6. Connecting Meiosis And Genetics
7. DNA – Blue Print For Life
8. Microevolution – How Does a Population Evolve?
9. Epidemiology
10. Population Growth