

**SEMESTER I & II**  
**LSM1301 GENERAL BIOLOGY**

**Preclusion:** GCE A-Level or H2 Biology, or equivalents or LSM1301X or LSM1301FC

**Course description:**

This introductory module explores the scientific study of life, at successive levels of organisation. The module begins with the chemistry of life and the smallest unit of life, the cell, which form the basis for energy and life. The inheritance of traits will also be discussed and the field of biotechnology, including its applications and associated ethical issues, will be explored. Diversity of life on earth will be discussed in the context of evolution and ecology. How organisms maintain their internal constancy and the organisation of major organ systems will also be explored. The focus of the module is the introduction of the unifying concepts of biology and how the concepts affect everyday life.

S/N	Topics	Hours
1	<b>Science of Biology</b> Attributes of a living thing. Classification of living things. Scientific method and the limits of science.	2 hrs
2	<b>Chemistry of Life</b> Functional groups. Condensation and hydrolysis. Structure and function of biological molecules - carbohydrates, lipids, proteins and nucleic acids.	2 hrs
3	<b>Cell Structure and Function</b> Size of a cell. Biological membranes. Structures and functions of prokaryotic and eukaryotic cells.	2 hrs
4	<b>Energy and Life</b> Energy release in cells. Aerobic cellular respiration - glycolysis, acetyl-CoA formation, citric acid cycle and oxidative phosphorylation. Fermentation. Breakdown of carbohydrates, lipids and proteins.	2 hrs
5	<b>DNA and Heredity</b> Genetic material. DNA structure and replication. DNA sequencing. Mitosis and meiosis.	2 hrs
6	<b>Gene Expression</b> Central dogma of molecular biology. RNA molecules and genetic code. Transcription, translation and mutations. Regulation of gene expression in prokaryotic and eukaryotic cells.	2 hrs
7	<b>Biotechnology</b> Genetically modified organisms - bacteria, plants and animals. DNA profiling. Genetic screening and gene therapy. Environmental, safety and ethical issues.	2 hrs
8	<b>Evolution</b> History of evolutionary thought. Theory of natural selection. How populations evolve. Evidence for evolution.	2 hrs
9	<b>Biodiversity</b> Species concepts. Identification, naming and classifying of organisms. Constructing and interpreting cladograms.	2 hrs
10	<b>Plant Form and Function</b> Major plant groups. Plant tissue types. Photosynthesis. Plant growth and reproduction.	2 hrs
11	<b>Animal Form and Function</b> Major animal groups. Animal tissues and selected organ systems. Homeostasis.	2 hrs
12	<b>Ecology</b> Population growth. Community interactions. Ecosystem dynamics. Human impacts on the environment.	2 hrs

S/N	Topics	Hours
13	Laboratory Session	12 hrs
14	Museum Visit	2 hrs
15	Tutorial (Face-to-Face/Online)	10 hrs

**Recommended Texts:**

1. *Biology* by Sylvia S. Mader and Michael Windelspecht, 12th Edition, 2016, McGraw-Hill Higher Education.
2. *Biology: Concepts and Investigations* by Marielle Hoefnagels, 3rd Edition, 2015, McGraw-Hill Higher Education.
3. *Biology: Life on Earth with Physiology* by Teresa Audesirk, Gerald Audesirk, and Bruce E. Byers, 11th Edition, 2017, Pearson
4. *Biology: The Unity and Diversity of Life* by Cecie Starr, Ralph Taggart, Christine Evers, and Lisa Starr, 15th Edition, 2019, Thomson Brooks/Cole.

**Mode of assessment:**

**Semester I**

60% Continual Assessments + 40% Final Examination

**Semester II**

40% Continual Assessments + 60% Final Examination

**Module coordinators:**

**Semester I**

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**Lecturers:**

**Semester I**

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