

PRE-REQUISITE: Fsc. or equivalent

LEARNING OUTCOMES:

- Explain the scope of biology and molecular basis of life
- Understand the cell, cell division and cell cycle
- Understand the origin of species and process of evolution
- Outline basic processes of cellular kinetics including Respiration and photosynthesis
- Explain the classification of living organism
- Understand the basic concepts of genetics and inheritance
- Understand basic ecology, ecosystem and biodiversity

CONTENTS

Unit-1: An introduction to Biology

- 1.1. Definitions and basic concept of biology
- 1.2. Different branches of biology
- 1.3. Significance of Biology in modern days

Unit- II: Chemical foundation of Life

- 2.1. Concept of cell and cell theories
- 2.2. Concept of organelles and their functions
- 2.3. Micro and macro molecules in living cells

Unit- III: Structure and functions of Cells

- 3.1. Types of cells, prokaryotes, Eukaryotes
- 3.2. Differences in structure and functions of different cells
- 3.3. Systems in living organisms

Unit- IV: Cell division and cell cycle

- 4.1. Introduction to cell cycles
- 4.2. Mitosis and meiosis

Unit- V: Cellular Kinetics

- 5.1. Cellular respiration and energy production
- 5.2. Glycolysis and Kreb's cycle
- 5.3. Photosynthesis
- 5.4. Transport in cells

Unit- VI: Biological organization and classification

- 1.1. Organization from sub atomic particles to biomes
- 1.2. Nomenclature and five kingdom system of classification
- 1.3. Species, population, communities, ecosystem and biodiversity

Unit- VII: Genetics and inheritance

- 7.1. Concepts of genes, alleles and inheritances
- 7.2. DNA, RNA, protein synthesis
- 7.3. Laws and theories of inheritance

Unit- VIII: Evolution and its processes

- 8.1. Origin of species and concept of evolution
- 8.2. Processes of evolution
- 8.3. Theories of evolution

TEACHING – LEARNING STRATEGIES

- Lectures based examinations
- Presentation/seminars
- Class discussion
- Quizzes

ASSIGNMENTS – TYPE AND NUMBER WITH CALENDAR

It is continuous assessment. The weightage of Assignments will be 25% before and after midterm assessment. It includes:

- classroom participation,
- attendance, assignments and presentation,
- homework
- attitude and behavior,
- hands-on-activities,
- short tests, quizzes etc.

ASSESSMENT AND EXAMINATIONS:

Sr. No.	Elements	Weightage	Details
1.	Mid Term Assessment	35%	It takes place at the mid of the semester
2.	Formative Assessment	25%	It is continuous assessment. It includes: classroom participation, attendance, deadlines of assignments and presentation, homework, attitude and behavior, hands-on-activities, short tests, quizzes etc.
3.	Final Assessment	40%	It takes place at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, field work and report writing etc.

RECOMMENDED TEXT BOOKS / SUGGESTED READINGS

1. Wells, H. G. (2018). *Text-book of Biology*. BoD–Books on Demand.
2. Reece, J. B., Urry, L. A., Cain, M. L., Wasserman, S. A., Minorsky, P. V., & Jackson, R. B. (2014). *Campbell biology* (No. s 1309). Boston: Pearson.
3. Klipp, E., Liebermeister, W., Wierling, C., & Kowald, A. (2016). *Systems biology: a textbook*. John Wiley & Sons.
4. Lewis, B., Cassimeris, L., Lingappa, V. R., Plopper, G. Jones (2007). *Cells*, and Bartlett Publishers. Canada

PRE-REQUISITE: FSc. or equivalent

LEARNING OUTCOMES:

- Introduction to microscope and microscopic organisms
- Differentiation between prokaryotic and Eukaryotic cell
- Differentiation between plants and animal cells
- Identification of bacteria, protozoans, fungus, Algae under microscope
- Examination of animal and plant tissues through thin sections
- Identification of different plants and animals
- Understanding different parts of living organisms
- Inflorescence of plants

CONTENTS

Unit- 1: Introduction to Microscope and microscopic organisms

- 1.1. Definitions and types of microscope
- 1.2. Significance of the use of microscope in biology
- 1.3. Microscopic and macroscopic organisms

Unit- II: Examination of Cell structure and function

- 2.1. Identification of prokaryotic and Eukaryotic cells
- 2.2. Identification of plant and animal cells
- 2.3. Identification of different organelles and their functions

Unit- III: Identification of different microorganisms

- 3.1. Identifications of slides of different Bacteria
- 3.2. Identifications of slides of different Protozoans
- 3.3. Identification of slides of different fungus and Algae

Unit- IV: Identification of different Microorganism

- 5.1. Identification of specimens of different plants and animals
- 5.2. Identification of different plants and animals in field
- 5.3. Examination of thin sections of plants and animals' tissues
- 5.4. Identifications various systems of plants and animals through specimens

Unit- V: Introduction to molecules of life

- 5.1. Studying carbohydrates, proteins, lipids, fats structure
- 5.2. Understanding enzymes and their functions

TEACHING – LEARNING STRATEGIES

- Lectures and practical performance based examinations
- Demonstrations,
- Field based learning
- Class discussion
- Quizzes

ASSIGNMENTS – TYPE AND NUMBER WITH CALENDAR

It is continuous assessment. The weightage of Assignments will be 25% before and after midterm assessment. It includes:

- classroom participation,
- attendance, assignments and presentation,
- homework
- attitude and behavior,
- hands-on-activities,
- short tests, quizzes etc.

ASSESSMENT AND EXAMINATIONS:

Sr. No.	Elements	Weightage	Details
1.	Mid Term Assessment	35%	It takes place at the mid of the semester
2.	Formative Assessment	25%	It is continuous assessment. It includes: classroom participation, attendance, deadlines of assignments and presentation, homework, attitude and behavior, hands-on-activities, short tests, quizzes etc.
3.	Final Assessment	40%	It takes place at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, field work and report writing etc.

RECOMMENDED TEXT BOOKS / SUGGESTED READINGS

1. Wells, H. G. (2018). *Text-book of Biology*. BoD–Books on Demand.
2. Reece, J. B., Urry, L. A., Cain, M. L., Wasserman, S. A., Minorsky, P. V., & Jackson, R. B. (2014). *Campbell biology* (No. s 1309). Boston: Pearson.
3. Klipp, E., Liebermeister, W., Wierling, C., & Kowald, A. (2016). *Systems biology: a textbook*. John Wiley & Sons.
4. Lewis, B., Cassimeris, L., Lingappa, V. R., Plopper, G. Jones (2007). *Cells*, and Bartlett Publishers. Canada,
5. Morgan, S. (2002). *Advanced Level Practical Work for Biology* (Advanced Level Practical Work Series). S. Hodder & Stoughton.