

BIOLOGY COURSES (DRAFT)

For Animal Technology

Biol 1 : Principles of Biology	3 credits
Biol 2 : Princ. of Biol. Lab.	1 credit
Biol 3 : Animal Biol.	3 credits
Biol 4 : An. Biol. LAB.	1 credit

For Plant Technology

Biol 1 : Principles of Biology	3 credits
Biol 2 : Princ. of Biol. Lab.	1 credit
Biol 5 : Plant Biology	3 credits
Biol 6 : Plant. Biol. Lab.	1 credit

For Engineering

Biol 1 : Principles of Biology	3 credits
Biol 2 : Princ. of Biol. Lab.	1 credit
Biol 7 : Man and Environment	4 credits

Principles of Biology (3 credits)

Part 1..... 12 Lectures

Introduction to Biology

Atoms, Molecules and Life

The Molecules of Living Things

Chemical Reactions

Enzymes

Metabolism

Cells : Their Properties, Surfaces, and Interconnections.

Inside the Living Cells : Structure and Function of Internal Cell Parts.

Energy from Nutrients : Fermentation and Cellular Respiration

Solar Energy to Produce Carbohydrate

Part 2..... 12 Lectures

Genetics and Inheritance

Cellular Reproduction : Mitosis, Meiosis

Foundation of Genetics

The Chemical Nature of Genes

Translating the Code of Life

Gene Expression

Part 3..... 10+(2) Lectures

Evolution and the Genetics of Population

Natural Selection

The Origin of Species

Ecosystem and the Biosphere

The Ecology of Community

The Ecology of Population

Behavioral Adaptation to the Environment

Social Behavior

Human Origin

Part 4..... 2+(1) Lectures

Conventional Applications of Organisms and their Activities.

The Modern Revolution

Genetic Engineering

Plasmid Technology

Hybridoma Technology

Principles of Biology Laboratory (1 Credit)

Concurrent with Principles of Biology

1. Living Matter : Chemical Composition
2. Living Matter : Enzyme Activity
3. Living Matter : Physical Properties
4. Microscope : Cells : Tissues & Organs
5. Mitosis and Meiosis
6. Cellular Metabolism : Respiration
7. Cellular Metabolism : Oxygen and ATP
8. Genetics
9. Evolution
10. Ecology

Plant Biology 3 Credits

Pre - requisite : Principles of Biology

Part 1 12 lectures

The Kingdoms of Life : Diversity and Classification

Kingdom Monera : The Prokaryotes.

- Evolutionary Trends
- Division Schizophyta - The Bacteria
- Division Cyanophyta - The Cyanobacteria
- Activities of Prokaryotes

Viruses

Kingdom Protista

- Evolutionary Trends
- Protozoa
- Algae
- Slime mold

Kingdom Fungus.

- Fungal Nutrition
- Classes of Terrestrial Fungi

The Plant Kingdom

- Evolutionary Trends
- Non Vascular Plants : The Bryophyte
- Vascular Plants : The Tracheophytes
- Lower Vascular Plants Seed Plants
- (The Animal Kingdom)

Part 2..... 12 lectures

Plant Tissues, Tissue Systems and Organs

The Basic Body (Plant) Design

Annuals, Biennials, and Perennials

Plant Tissues

Plant Tissue System

Plant Organs

Circulation in Plants : Transporting Water, Minerals and Food

Xylem : Water and Mineral Transport

Phloem : Food Transport

Processing Energy : Photosynthesis

The Light Reactions

The Synthesis Reactions

Photorespiration

Chemosynthesis

Part 3..... 9 lectures

Sexual Reproduction of Flowering Plants

Flower Structure

Formation of Gametes

Pollination and Fertilization

Seed Dispersal

Germination and Seedling Development

Plant Growth and Development

Control of Growth and Development

Plant Hormones

Timing Growth and Development

Plant Tropism

Part 4..... 3 lectures

Plant Biotechnology

Plant Biology Laboratory (1 Credit)

Concurrent with Plant Biology

1. Kingdom Monera and
Protista
2. Kingdom Fungi and
The Plant Kingdom
3. Plant Tissues
4. Plant Organs
5. Plant Absorption
6. Translocation
7. Transpiration
8. Photosynthesis
9. Reproduction of Seed Plant
10. Plant Hormones
(Auxins, Gibberellins, Kinins)
Response of Movement
Response of Development

Animal Biology (3 Credits)

Pre-Requisite : Principles of Biology

Part 1..... 6 Lectures

The Origin and Diversity of Life

(The Monera Kingdom and Viruses)

(The Protista Kingdom)

(The Fungi Kingdom)

(The Plant Kingdom)

The Animal Kingdom

- Evolutionary Trends

- Criteria for Classifying Animals

- Major Animal Phyla

Part 2..... 18+ (3) Lectures

Multicellular Organization of Animals

Animal Tissues and Organ System

The Circulatory and Transport Systems

The Immune System

Respiration

Digestion and Nutrition

Homeostasis : Maintaining Biological Constancy

The Nervous System

Harmonal Controls

The Senses Organs and the Brain

Skeleton and Muscle

Part 3..... 9 Lectures

Reproduction and Development

Animal Reproduction

Animal Development

Developmental Mechanisms and Differentiation

Part 4..... 3 Lectures

Animal Biotechnology

Animal Biology Laboratory (1 Credit)

Concurrent with Animal Biology

1. Animal Classification
2. Animal Tissues
3. Circulatory and Transport system
4. Respiratory System
5. Digestion & Nutrition
6. Excretory System
7. Nervous System
8. Sense Organs & Reflex action
9. Muscle & Skeletal system
10. Animal Reproduction & Development

Man and Environments (4 credits)

Pre - requisite : Principles of Biology

Evolution of Human Populations

Man among the animals

The origin of man

The world of early man

Environment of Human Populations

Energy

Living system and energy

Atmospheric Influences of Solar Radiation

Environmental Heat from Solar Radiation

Solar Energy as Food Source

Industrial Energy

Atmosphere

Composition of Air

Oxygen Cycle

Carbon cycle

Nitrogen cycle

Man and the cycles

Atmosphere Pollution

Effects of Air Pollutant

Interactions of the Atmosphere and Human Populations

Water

The Hydrologic Cycle

Evaporation and Transpiration

Condensation and Precipitation

Distribution of Precipitation

Water and Living Things

Water Quality

Water Purification

Quantities and Sources of Water for Human Use

Water Resources and Their Development

Soils

Composition of Soil

Soil Types

Land Areas Without Soil

Soil Texture

Soil Water

Soil Air

Organisms in the Soil

Organic Matter and Humus

Factor Affection Soil Formation

Land Management : Soil Fertility

Soil Maintenance and Problems

Soil and Human Populations

The Biotic Environment : flora and Fauna

Man in the Food Web

Plants in Human Society

Animals in Human Society

Impact of Domestication and Cultivation

Pest Control

Climax and Biomes

Biogeographical Considerations

The Oceans

Physical and Chemical Conditions

Biotic Divisions and Zonation

Food Chain and Productivity

Estuaries, Mangroves and Coral Reefs

Ecosystem management and control of environmental quality

Ecosystem management

Specific conservation measures

(air resources, marine resources, fresh-water resources, serial resources,
plant resources, wild animal resources)

Land use and planning

Control of environmental quality
Climate modification and Control
Air pollution control
Water treatment and purification
Control and management of wastes.

Population Dynamics : Growth and Density Trends

Population Growth
Causes of Population Growth
The Demographic Transition
Population Theories
Sociology of Fertility

Environment and Population Pattern

World distribution of Human Population
Limiting Factors
Human Settlements
Industrialization
The Human Population Explosion and the Future
of Life on Earth.
