

BT-108 BIOLOGY LAB

Course Details

Course Title	Fundamentals of Biology	Course Code	BT-108
Year	I	Course Group	Practical
Teaching Scheme in Periods(L:T:P)	30:0:60	Credits	2
Methodology	Lecture+Practical	Total Contact periods	90
CIE	60 M	YEAR END EXAM	40M

Pre requisites:

This course requires the basic knowledge of biology of secondary school level

Course Outcomes (COs):

Upon completion of the course, the student shall be able to

CO 1	Learn working and operation of compound microscope, Morphology of bacteria, fungi and plantkingdom, inflorescence and reproductive organs of flowers
CO 2	Study the growth of pollen tubes on stigma, how the female gametophyte develops in the ovary, to prepare herbarium sheets of flowering plants, Paper chromatography experiment, Anatomy and morphology of monocot stem and root, dicot stem and root
CO 3	Learn to Identify plant family, different modifications of root, leaf, and stem, study the stages of meiosis in plant cells, mitosis in onion root tip cells.
CO 4	Identify the specimen and real models of invertebrates, histological slides of mammals
CO 5	Learned the dissection from model and printed charts of Digestive system, Nervous systemof earthworm and cockroach , Spermatheca of earthworm and mouth part of cockroach
CO 6	With the help of prepared permanent slides learn Transverse section of pancreas Longitudinal section of kidney, Transverse section of testis, Transverse section of ovary, joints of human body with human skeleton model

CO-PO Mapping

Course Outcome/ Programme Outcome	Basic and Discipline Specific Knowledge	Problem Analysis	Design/Development of Solutions	Engineering Tools, Experimentation and Testing	Engineering Practices for Society, Sustainability and Environment	Project Management	Lifelong Learning	Linked PO
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO 7	
CO1	3			3	-	-	1	1,4,7
CO2	3			2		-	1	1,4,7
CO3	3			3	-	-	1	1,4,7
CO4	3	1	1	3	-	-	1	1,2,3,4,7
CO5	3	1	1	3	-	-	1	1,2,3,4,7
CO6	3			3	-	-	1	1,4,7
	3	2	1	3	-	-	1	1,2,3,4,7

TIME SCHEDULE

S.No	Content	Periods
1	Unit 1	12
2	Unit 2	15
3	Unit 3	13
4	Unit 4	15
5	Unit 5	20
6	Unit 6	15

Course contents

UNIT-I

DURATION:12

- Study of **compound microscope** – parts and working.
- Identification of different types of bacteria, fungi, and plant groups with one representative sample model or slide and their morphology.
- Study different types of special inflorescence in plants.
- Externally study the reproductive organs of three commonly available flowers.
- Experiment to observe pollen germination under a microscope for different flowers,

UNIT-II

DURATION:15

- Study the growth of pollen tubes on stigma using prepared slides
- Dissect and observe how the female gametophyte develops gradually in the ovary of a commonly available flower.
- Learn how to prepare herbarium sheets of at least three commonly available flowering plants.
- Paper chromatography experiment – separate chlorophyll pigments from the extract of a common leaf
- Study the anatomy and morphology of the following:

Monocot root and stem, Dicot root and stem.

- Prepare and mount the following samples on a microscope and observe:

Monocot root and stem, Dicot root and stem

UNIT-III

DURATION:13

- Identify with reasons these families:
1. Solanaceae 2. Liliaceae 3. Fabaceae
- Identify different modifications of root, leaf and stem
- Use prepared permanent slides to study the stages of meiosis in plant cells.
- Use temporary slides prepared by teacher/lab instructor to study mitosis in onion root tip cells.
- Study and reflect on the following experimental setup:
Anaerobic respiration, Phototropism, Apical bud removal, Imbibition of seeds
- Potato osmoscope experiment – study of rate of osmosis.

UNIT-IV

DURATION:15

Study the following prepared permanent slides (as available) and learn to identify the specimen with reasons for classification:

- Invertebrate slides: amoeba, euglena, paramecium, hydra, taenia solium, ascaris (male & female), silk moth and worm, honey bee
- Histological slides: squamous epithelium, columnar epithelium, transverse section of cartilage and bone, blood smear of mammals, strained and unstrained muscles

UNIT-V

DURATION:20

Study with printed charts or models of the following dissections (no live dissection student has to draw diagram):

- Digestive system of earthworm
- Nervous system of earthworm
- Spermatheca of earthworm

Study with prepared permanent slides of the following and identify

- Mouth parts of cockroach
- Digestive system of cockroach,
- Nervous system of cockroach

Study the following vertebrate (mammal) body parts with prepared permanent slides:

- Transverse section of stomach
- Transverse section of intestine
- Transverse section of liver

UNIT-IV

DURATION:15

Study the following vertebrate (mammal) body parts with prepared permanent slides:

- Transverse section of pancreas
- Longitudinal section of kidney
- Transverse section of testis
- Transverse section of ovary

Study with dissectable models the following parts of human body:

- Arterial system, Venous system, Urinogenital system

Identify and study the various joints in a human body using a model skeleton:

- Ball and socket joint, Hinge joint, Pivot joint, Gliding joint

Reference: tsbie.cgg.gov.in TELANGANA BOTANY and ZOOLOGY PRACTICAL MANUAL

Online websites: Virtual labs(MHRD), LabXchange, OLabs, Science Buddies

EXAMINATION & EXPERIMENTS		
S.NO	EXAMINATION	EXPERIMENTS
1	MID-I	Unit 1, 2 & 3
2	MID-II	Unit 4, 5 & 6
3	YEAR END EXAMINATION (YEE)	Unit 1,2,3,4, 5, 6

Scheme of Valuation of YEE		
S.No	Particulars	Marks
1.	Major Experiment	12
2.	Minor Experiment	8
3.	Microscope Study	05
4.	Slide / Spotter Identification	05
5.	Viva Voce – 5 Marks	05
6.	Practical Record & Lab Work	05
	Total	40

Scheme of Evaluation – Biology Practical Experiments

A. Major Experiment – 12 Marks

Component	Details	Marks
Aim	Correct statement of aim	1
Principle	Scientific principle involved	3
Procedure	Stepwise procedure	3
Observation / Diagram	Correct observation / neat labelled diagram	2
Result	Correct result	2
Precautions	Any two relevant precautions	1
Total		12

B. Minor Experiment / Demonstration – 5 Marks

Component	Marks
Aim	1
Procedure	3
Observation	2
Result / Precautions	2
Total	8

C. Microscope Study – 5 Marks

Component	Marks
Identification of microscope	1
Parts identification (any four)	2
Focusing & handling	1
Observation / Viva	1
Total	5

D. Slide / Spotter Identification – 5 Marks

Component	Marks
Identification	2
Characters / Features (any two)	2
Diagram / Use	1
Total	5

E. Viva Voce – 5 Marks

F. Practical Record & Lab Work – 5 Marks

Component	Marks
Completion of record	2
Neatness & diagrams	2
Regular lab work	1
Total	5