INSTITUTE	**FACULTY OF SCIENCE**
PROGRAM	**BACHELOR OF SCIENCE (MICROBIOLOGY)**
SEMESTER	**1**
COURSE TITLE	**EXPERIMENTAL LABORATORY- I**
COURSE CODE	**02MB0106**
COURSE CREDITS	**3**

Objective:

1 To enable students with practical skills of Basic Microbiology, Fundamental Biology and allied subject like Chemistry or Physics.

2 To enable students with practical skills of Basic Microbiology, Fundamental Biology and allied subject like Chemistry or Physics.

Course Outcomes: After completion of this course, student will be able to:

1 Students will become aware of the Microbiology related instruments.

2 Students will learn staining techniques and observation of microbes under Microscope.

3 Students will be able to learn about microscopic structural features of Plants and Animals.

4 Students will be able to learn different practical techniques of Biology, Chemistry and Physics.

5 Students will be able to analyze, interpret and record the experimental results.

Pre-requisite of course:NA

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
0	0	6	0	0	0	50	50

Contents : Unit	Topics	Contact Hours
Total Hours		

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	**Basics of Microbiology** Introduction, Principle and working of given laboratory equipment's., Basic Microbe handling techniques, Monochrome staining, Negative staining, Gram's staining, Cell wall staining, Nucleus staining, Capsule staining, Metachromatic granule staining	2

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Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
2	**Chemistry-1** Demonstrations for laboratory glassware and instruments., To prepare solutions of acid and base with definite concentration., To determine normality, molarity and gm/lit of given strong acid with the help of known concentration of strong base., To determine normality, molarity and gm/lit of given weak acid with the help of known concentration of strong base., To determine normality, molarity and gm/lit of given weak base (Na2CO3/NaHCO3) with the help of known concentration of strong acid., To determine normality, molarity and gm/lit of given FeSO4.7H2O with the help of known concentration of KMnO4 ., To determine normality, molarity and gm/lit of given FeSO4(NH4)2SO4.6H2O with the help of known concentration of K2Cr2O7., To determine normality, molarity and gm/lit of each component in the given mixture of Na2CO3 and NaHCO3 with the help of known concentration of HCl., To determine the amount of chloride in the given sample of water using 'X' N AgNO3 solution., To calibrate and determine the boiling point of an organic compound., To calibrate and determine the melting point of organic compounds., Preparation of liquid soap	2
3	**Physics-1** To measure the length, width and height of the given rectangular block using vernier calipers., To determine the diameter of a given wire using micrometer screw gauge, To find the weight of a given body using the Parallelogram law of vectors., To determine co efficient of statics friction of the surface., To determine the restoring force per unit extension of a spiral spring. (Spring Constant), To determine the value of acceleration due to gravity 'g' by using a simple pendulum., To determine moment of inertia of a disc about the wire as axis and rigidity of the material of wire Torsional pendulum., To find the refractive index (μ) of material of prism using spectrometer., To study variation in thermoelectric potential using Thermocouple., To determine the radius of curvature of a convex mirror using a Spherometer.	2

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
4	**Fundamental Biology** Structure, life cycle and systematic position of (a) Cyanobacteria – Nostoc (b) Algae –Spirogyra., Structure, life cycle and systematic position (a) Bryophytes -Riccia, (b) Pteridophyta., Structure, life cycle and systematic position of Gymnosperm – Cycas -T.S of leaflet, megasporophyll, microsporophyll., Structure, life cycle and systematic position of Angiosperm – Root (Dicot/Monocot), Stem (Dicot/Monocot), Leaves (Dicot/Monocot)., To study the classification of non-chordates with reasons of the following (a) Protozoa- Amoeba (b) Porifera- Sycon(c) Coelenterata- Hydra/anyone coral (d) Platyhelminthes- Tapeworm/Planeria/Liverfluke(e)Nematoda (Aschelminthes)- Ascaris, To study the classification of non-chordates with reasons of the following (f) Annelida- Tubifex, Leech and Neries (g) Arthopoda – Spider, Bees, Crab, Lobster (h) Mollusca – Snail, Slug, Octopus (i) Echinodermata –Starfish, To observe the T.S. of (a) Epithelial, (b) Connective, (c) Muscle and (d) Nerve tissues using permanent slides., To observe pollen tube germination under microscope., L.S. of germination seed of to observe (a) embryo (b) endosperm (c) seed coat of Vigna/Zea may/Pisium, To observe the response of light on seedling germination and demonstrate phototropism, To observe the plasmodium signet ring in RBC cells using permanent slides.	2
Total Hours		**8**

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking / Creative**
20.00	30.00	25.00	15.00	10.00	

Instructional Method:

1 Practical examination will be conducted at the end of semester for evaluation of performance of students in laboratory.

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