INSTITUTE	**FACULTY OF SCIENCE**
PROGRAM	**BACHELOR OF SCIENCE (CHEMISTRY)**
SEMESTER	**1**
COURSE TITLE	**FUNDAMENTAL BIOLOGY**
COURSE CODE	**02MB0105**
COURSE CREDITS	**4**

Objective:

1 To provide students with an organized approach of living systems and their classification, organization and development

2 To provide students with an organized approach of living systems and their classification, organization and development.

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

1 Identify, recognize, list and label the biological organism in nature.

2 Able to identify the structure, composition of plants and animal systems.

3 Analyse physiological properties of plant and animal systems.

4 Describe the growth, reproduction and development of plants and animal systems.

Pre-requisite of course:NA

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
4	0	0	50	30	20	0	0

Contents : Unit	Topics	Contact Hours
1	**Plant Systematics** Algae, Bryophyta, Pteridophyta, Gymnosperm & Angiosperm; Plant classification system	10
2	**Animal Systematics** Classification of Animals, Non-chordates upto phyla level & chordates upto class level.	10

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Contents : Unit	Topics	Contact Hours
3	**Structural Organization in Plants** Plant Anatomy & Morphology: Morphology and anatomy of flowering plants: Root, Stem, Leaf, Inflorescence, Flower, Fruit and Seed., Plant Physiology: Mineral Uptake & Transport, Photosynthesis and its Types; (PS I, PS II, C3, C4, CAM), Growth & Reproduction in Plants Pollination (Self & Cross), Fertilization & Seed Development, Germination, Plant growth. Overview of Regulation of Plant Growth: Tropism (Phototropism, Gravitropism&Thigmotropism); Basic functions of Plant Hormones: Auxins, Cytokinins, Gibberlins, Ethylene&Abscisic acid.	20
4	**Structural Organization in Animals** Tissues: Epithelial, Connective, Muscle and Nerve, Organ Systems: Digestive, Respiratory, Nervous, Circulatory, Endocrine, Reproductive and Excretory., Growth & Reproduction in Animals Gametogenesis, Fertilization, Embryonic development (cleavage, blastula, Gastrulation, Cell migration, organogenesis) and growth.	20
Total Hours		**60**

Textbook :

1 College Botany Volume I and II, Gangulee, Das and Dutta , New Central Education enterprises, 2011

References:

1 Biology (11th Edition), Biology (11th Edition), Peter Raven, George Johnson, Kenneth Mason, Jonathan Losos and Susan Singer , McGraw Hill, 2017

2 College Botany Volume I and II, College Botany Volume I and II, Gangulee, Das and Dutta , New Central Education enterprises, 2011

3 Plant physiology and development, Plant physiology and development, Taiz, Lincoln, Eduardo Zeiger, I. M. Møller, and Angus S. Murphy, Sunderland, Massachusetts, U.S.A: Sinauer Associates, Inc., Publishers. , 2015

4 Biology of Animals, Biology of Animals, Ganguly, BB., Sinha, A.K., Adhikari, S., New Central Book Agency, Kolkata, 1988

5 Life of Invertebrates, Life of Invertebrates, Prasad, SN, Vikas Publishing House, New Delhi, 1980

6 A Text Book of Practical Botany -1 and 2, A Text Book of Practical Botany -1 and 2, Dr. Ashok Bendre, Rastogi Publications, 1984

7 Textbook of Vertebrate Zoology, Textbook of Vertebrate Zoology, Prasad, SN and Kashyap, V, New Age India Publishers, New Delhi, 2011

8 Textbook of Human Physiology , Textbook of Human Physiology , Sarada Subrahmanyam et al, S. Chand and Co., New Delhi, 2010

9 Chordate Embryology, Chordate Embryology, P S Verma& V K Agarwal, S. Chand and Co., New Delhi, 2010

10 Chordate Zoology, Chordate Zoology, E L Jordan & P S Verma, S. Chand and Co., New Delhi, 2013

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	0.00

Instructional Method:

1. The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, role play, Quiz, brainstorming, etc.
2. The internal evaluation will be done on the basis of continuous evaluation of students in the class-room in the form of attendance, assignments, verbal interactions etc.
3. Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory.

Supplementary Resources:

1. https://www.k-state.edu/fergusonlab/lab.html
2. https://jigyasa-csir.in/iiim/n4-t1-a2/
3. https://www.biointeractive.org/classroom-resources/lizard-evolution-virtual-lab
4. https://www.uwlax.edu/biology/zoo-lab/lab-1--animal-phylogenetics/
5. https://vlab.amrita.edu/?sub=3&brch=177&sim=1798&cnt=6
6. http://cbi-au.vlabs.ac.in/cell-biology-1/Cell_Organization_and_Sub_Cellular_Structure_Studies/

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