Syllabus for Bachelor of Science
Microbiology

Subject Code: 02MB0105

Subject Name: Fundamental Biology

B.Sc. Microbiology– Sem I

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

Credits Earned: 4 Credits

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

- Identify, recognize, list and label the biological organism in nature.
- Able to identify the structure, composition of plants and animal systems.
- Analyse physiological properties of plant and animal systems.
- Describe the growth, reproduction and development of plants and animal systems.

Teaching and Examination Scheme

Teaching Scheme (Hours)			Credits	Theory Marks			Tutorial/ Practical Marks		Total Marks
Theory	Tutorial	Practical		ESE (E)	IA(M)	CSE (I)	Viva (V)	Term work (TW)	
4	0	0	4	50	30	20	0	0	100

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
3	**Structural Organization in Plants** **A. Plant Anatomy & Morphology:** Morphology and anatomy of flowering plants: Root, Stem, Leaf, Inflorescence, Flower, Fruit and Seed. **B. Plant Physiology:** Mineral Uptake & Transport, Photosynthesis and its Types; (PS I, PS II, C3, C4, CAM) **C. 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	20

	Hormones: Auxins, Cytokinins, Gibberlins, Ethylene&Abscisic acid.	
4	**Structural Organization in Animals** **A Tissues:** Epithelial, Connective, Muscle and Nerve; **B Organ Systems**: Digestive, Respiratory, Nervous, Circulatory, Endocrine, Reproductive and Excretory. **C. Growth & Reproduction in Animals** Gametogenesis, Fertilization, Embryonic development (cleavage, blastula, Gastrulation, Cell migration, organogenesis) and growth.	20
	Total Hours	60

References:

1. Biology (11th Edition), Peter Raven and George Johnson and Kenneth Mason and Jonathan Losos and Susan Singer (2017), McGraw Hill.
2. College Botany Volume I and II, Gangulee, Das and Dutta (2011), New Central Education enterprises.
3. Plant physiology and development, Taiz, Lincoln, Eduardo Zeiger, I. M. Møller, and Angus S. Murphy (2015), Sunderland, Massachusetts, U.S.A: Sinauer Associates, Inc., Publishers.
4. Invertebrate Structure and Function, EJW Barrington, ELBS, 3rd Edition.
5. Biology of Animals, Ganguly, BB., Sinha, A.K., Adhikari, S., New Central Book Agency, Kolkata.
6. Life of Invertebrates, Prasad, ASN. Vikas Publishing House, New Delhi
7. Textbook of Vertebrate Zoology, Prasad, SN and Kashyap, V., New Age India Publishers, New Delhi.
8. A Text Book of Practical Botany -1 and 2, Dr. Ashok Bendre, Rastogi Publications.
9. Textbook of Human Physiology Sarada Subrahmanyam, K Madhavankutty& H D Singh. S. Chand and Co., New Delhi, ISBN: 9788121902168
10. Chordate Embryology, P S Verma& V K Agarwal, S. Chand and Co., New Delhi ISBN: 9788121902618.
11. Chordate Zoology, E L Jordan & P S Verma, S. Chand and Co., New Delhi, ISBN: 9788121916394

Suggested Theory distribution:

The suggested theory distribution as per Bloom's taxonomy is as per 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	Understand	Apply	Analyze	Evaluate	Create
20%	30%	25%	15%	10%	0%

Instructional Method:

a. 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.

b. 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.

c. Students will use supplementary resources such as online videos, NPTEL videos, e-courses, Virtual Laboratory.