## BSLS 102 Cell Biology and Basic Microbiology

| COURSE CODE | Category | COURSE NAME | TEACHING & EVALUATION SCHEME | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | THEORY | | | PRACTICAL | | Th | T | P | CREDITS |
| | | | END SEM University Exam | Two Term Exam | Teachers Assessment* | END SEM University Exam | Teachers Assessment* | | | | |
| BSLS 102 | DC | Cell Biology & Basic Microbiology | 50 | 30 | 20 | 30 | 20 | 1 | 1 | 2 | 3 |

**Legends:** L - Lecture; T - Tutorial/Teacher Guided Student Activity; P – Practical; C - Credit;
***Teacher Assessment shall be based following components: Quiz/Assignment/ Project/ Participation in Class, given that no component shall exceed more than 10 marks.**

### Course Objectives:

1. To give a comprehensive idea about the structural aspects of plant and animal cells and cellular organelles
2. To give a comprehensive idea about the important classes of microorganisms and their importance

### Course Outcomes:

1. Student will be able to understand the structure and function of cell organelles, cell divisions and cell cycle
2. Student will be able to understand the salient features of microorganisms, their importance in nature and their control

### A. Cell Biology

**Unit-I**
Discovery of cell and cell theory.Structure of prokaryotic and eukaryotic cells.Cell division and cell cycle.Cell synchrony and Cell signaling.
Structure and function of Cell wall and Plasma membrane.Diffusion and Osmosis: ion channels and ion pumps.

**Unit - II**
Structure and function of – Mitochondria and Chloroplast.
Nucleus and Nucleolus. Structure of chromosomes, Polytene and Lampbrush Chromosomes

**Unit - III**
Structure and function of - Endoplasmic reticulum, Golgiapparatus, Lysosomes, Ribosomes, Microtubule, Microfilaments andIntermediate filaments.

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**B. Basic Microbiology**

**Unit- IV**

History of microbiology; Important discoveries in Microbiology; Structure of bacteria; Classification of microorganisms and major groups of bacteria; General characteristics of viruses

**Unit - V**

Nutritional classes of bacteria; Types of media and cultivation of bacteria; Factors affecting growth; Batch, continuous and synchronous culture;
Measurement of bacterial growth; Growth curve and phases of growth cycle; Generation time and growth rate
Control of microorganisms - Physical methods [temperature, filtration, radiation]; Chemical methods for disinfection and sanitation
Role of microorganisms in nitrogen carbon, sulphur and phosphorus cycle

**BSLSL105 Practical**

1. Aseptic transfer techniques for microorganisms.
2. Morphological study of microorganisms by:
   a) Wet mount
   b) Monochrome staining
   c) Gram staining
   d) Spore staining
   e) Fungal staining
3. Preparation of liquid and solid media for culturing bacteria/fungi.
4. Isolation of bacteria from air/water/soil by Streak Plate Technique.
5. Techniques for enumeration of microorganisms:
   a) Pour plate method
   b) Spread plate method
   c) Cell count by Neubauer's Chamber
   d) Plaque Count
   e) Turbidometric method
6. Observation of motility of microorganisms by:
   a) Hanging drop technique
   b) Swarming growth
7. Growth curve of bacteriaand calculation of generation time.

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