### Course Number and Name

### **BBT102 - BIOLOGY FOR ENGINEERS**

### Credits and Contact Hours

### 2 & 30

Course Coordinator's Name

# Ms.Priya

Text Books and References

### **TEXT BOOKS:**

- 1. A Text book of Biotechnology, R.C.Dubey, S. Chand Higher Academic Publications, 2013
- 2. Diseases of the Human Body, Carol D. Tamparo and Marcia A. Lewis, F.A. Davis Company, 2011.
- 3. Biomedical instrumentation, Technology and applications, R. Khandpur, McGraw Hill Professional, 2004

# **REFERENCE BOOKS**

- 1. Biology for Engineers, Arthur T. Johnson, CRC Press, Taylor and Francis, 2011
- 2. Cell Biology and Genetics (Biology: The unity and diversity of life Volume I), Cecie Starr, Ralph Taggart, Christine Evers and Lisa Starr, Cengage Learning, 2008
- 3. Biotechnology Expanding horizon, B.D. Singh, Kalyani Publishers, 2012

|               | _   |  |          |          |           |           |          |          |               |          |         |          |   |      |  |  |
|---------------|---|--|----------|----------|-----------|-----------|----------|----------|---------------|----------|---------|----------|---|------|--|--|
|               | rse Desc  |  |          |          |           |           |          |          |               |          |         |          |   |      |  |  |
| Gair          | n vivid k   | now  | ledge in | the fun  | damenta   | ils and u | ses of b | iology,  | human s       | ystem a  | nd plan | t system | • |      |  |  |
| Prerequisites |   |  |          |          |           |           |          |          | Co-requisites |          |         |          |   |      |  |  |
| Basic Science |   |  |          |          |           |           |          |          | NIL           |          |         |          |   |      |  |  |
|               |   |  |          | require  | ed, elect | ive, or s | elected  | elective | (as per '     | Table 5- | -1)     |          |   |      |  |  |
|               |   |  |          |          |           |           |          |          |               |          |         |          |   |      |  |  |
|               | rse Outc  |  |          |          |           |           |          |          |               |          |         |          |   |      |  |  |
| CO1           | -   | Graduates within the first five years will be able to grasp and apply biological engineering                       |          |          |           |           |          |          |               |          |         |          |   | ring |  |  |
|               | principles, procedures needed to solve real-world problems. |  |          |          |           |           |          |          |               |          |         |          |   |      |  |  |
| CO2           |   | To understand the fundamentals of living things, their classification, cell structure and biochemical constituents |          |          |           |           |          |          |               |          |         |          |   |      |  |  |
| CO3           |   | To apply the concept of plant, animal and microbial systems and growth in real life situations                     |          |          |           |           |          |          |               |          |         |          |   |      |  |  |
| CO4           |   | To comprehend genetics and the immune system   |          |          |           |           |          |          |               |          |         |          |   |      |  |  |
| CO5           |   | To know the cause, symptoms, diagnosis and treatment of common diseases  |          |          |           |           |          |          |               |          |         |          |   |      |  |  |
| CO6           |   | To give a basic knowledge of the applications of biological systems in relevant industries                         |          |          |           |           |          |          |               |          |         |          |   |      |  |  |
| Stud          | lent Out  | come   | es (SOs) | ) from C | riterion  | 3 covere  | ed by th | is Cours | se            |          |         |          |   |      |  |  |
|               | COs/S   | Os   | a        | b        | с         | d         | e        | f        | g             | h        | i       | j        | k |      |  |  |
|               | CO1<br>CO2  |  | Η        |          |           |           |          |          | M             |          |         |          |   |      |  |  |
|               |   |  |          | Н        |           |           |          |          |               |          | Η       |          |   |      |  |  |
|               | CO3   | 3  |          |          | Н         |           |          |          |               |          |         | М        |   |      |  |  |
|               | CO4   | ł  |          |          |           |           |          |          |               |          |         | Н        |   |      |  |  |

|                        | CO5 |  |  |  |  |  |   |  |  |  |  |  |
|------------------------|-----|--|--|--|--|--|---|--|--|--|--|--|
|                        | CO6 |  |  |  |  |  | Н |  |  |  |  |  |
| List of Topics Covered |     |  |  |  |  |  |   |  |  |  |  |  |

UNIT I INTRODUCTION TO LIFE

Characteristics of living organisms-Basic classification-cell theory-structure of prokaryotic and eukaryotic cell-Introduction to biomolecules: definition-general classification and important functions of carbohydrates-lipids-proteins-nucleic acids vitamins and enzymes-genes and chromosome.

## UNITII BIODIVERSITY

Plant System: basic concepts of plant growth-nutrition-photosynthesis and nitrogen fixation-Animal System: elementary study of digestive-respiratory-circulatory-excretory systems and their functions-Microbial System: history-types of microbes-economic importance and control of microbes.

### UNITIII GENETICS AND IMMUNE SYSTEM

Evolution: theories of evolution-**Mendel's** cell division-mitosis and meiosis-evidence of e **laws of inheritance**-variation and speciation-nucleic acids as a genetic material-central dogma immunity-antigens-antibody-immune response.

### UNIT IV HUMAN DISEASES

Definition- causes, symptoms, diagnosis, treatment and prevention of diabetes, cancer, hypertension, influenza, AIDS and Hepatitis

### UNIT V BIOLOGY AND ITS INDUSTRIAL APPLICATION

Transgenic plants and animals-stem cell and tissue engineering-bioreactors-biopharming-recombinant vaccines-cloning-drug discovery-biological neural networks-bioremediation-biofertilizer-biocontrol-biofilters-biosensors-biopolymers-bioenergy-biomaterials-biochips-basic biomedical instrumentation.

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