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| Course Number and Name | |
| BBT102 –BIOLOGY FOR ENGINEERS | |
| Credits and Contact Hours | |
| 2&30 | |
| Course Coordinator's Name | |
| Dr.Srilatha | |
| Text Books and References | |
| <p>TEXT BOOKS:</p> <ol style="list-style-type: none"> 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 <p>REFERENCE BOOKS</p> <ol style="list-style-type: none"> 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 | |
| Course Description | |
| Gain vivid knowledge in the fundamentals and uses of biology, human system and plant system. | |
| Prerequisites | |
| Co-requisites | |
| Basic Science | Nil |
| required, elective, or selected elective (as per Table 5-1) | |
| Required | |
| Course Outcomes (COs) | |
| CO1 | Graduates within the first five years will be able to grasp and apply biological engineering 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 |

| Student Outcomes (SOs) from Criterion 3 covered by this Course | | | | | | | | | | | | |
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| COs/SOs | a | b | c | d | e | f | g | h | i | j | k | l |
| CO1 | H | | | | | | M | | | | | |
| CO2 | | H | | | | | | | H | | | |
| CO3 | | | H | | | | | | | M | | |
| CO4 | | | | | | | | | | H | | |
| CO5 | | | | | | | | | | | | |
| CO6 | | | | | | H | | | | | | M |

List of Topics Covered

UNIT I INTRODUCTION TO LIFE 9

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.

UNIT II BIODIVERSITY 9

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.

UNIT III GENETICS AND IMMUNE SYSTEM 9

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 9

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

UNIT V BIOLOGY AND ITS INDUSTRIAL APPLICATION 9

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.