Academic Course Description

BHARATH UNIVERSITY
Faculty of Engineering and Technology
Department of Civil Engineering
BBT102 BIOLOGY FOR ENGINEERS
First Semester, 2017-18 (Odd Semester)

Course (catalogue) description

Understand the basic concepts of basics in biology, human and plant system.

Compulsory/Elective course: Compulsory for all branches

Credit & Contact hours : 2 credits & 30 hours

Course Coordinator : Ms.Priya, Asst. Professor

Instructors :

Name of the instructor	Class handling	Office location	Office phone	Email (domain:@ bharathuniv.ac.in	Consultation
Ms.Priya	All First Year Students	FIRST YEAR MAIN BULIDING			9.00-9.50 AM
MR.PRADEEP SARAVANAN	All First Year Students	FIRST YEAR MAIN BULIDING		asstprofpradeep2015@gmail.com	**11.00 – 12.30 pm**

Relationship to other courses:

Pre –requisites **:** The student will understand the concepts in the basic science

Assumed knowledge : The students will have to understand the fundamentals of biological systems and its applications towards industries to solve the problems in the real life.

Following courses : Nil

Syllabus Content

UNIT I INTRODUCTION TO LIFE 6

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 6

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 6

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 6

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

UNIT V BIOLOGY AND ITS INDUSTRIAL APPLICATION 6

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.

Computer usage: Nil

Professional component

General	-	0%
Basic Sciences	-	100%
Engineering sciences & Technical arts	-	0%
Professional subject	-	0%

Broad area : Life, Biodiversity, Immune Systems, diseases and bioproducts

Test Schedule

S. No.	Test	Tentative Date	Portions	Duration
1	Cycle Test-1	August 1st week	Session 1 to 14	2 Periods
2	Cycle Test-2	September 2nd week	Session 15 to 28	2 Periods
3	Model Test	October 2nd week	Session 1 to 45	3 Hrs
4	University Examination	TBA	All sessions / Units	3 Hrs.

Mapping of Instructional Objectives with Program Outcome

This course emphasizes:	Correlates to program outcome		
	H	M	L
1. To understand the basics of living cells and biomolecules	b,c,m,d,j	a,f,k	e,g
2. To illustrate the importance of microbes in the biodiversity	b,c,f	a,d,g,h	j,m
3. To demonstrate the genetics involved in the Immune System	a,d,e	b,g,n	j,k
4. To explain in detail about the human diseases	a,d,e,n	b,g,h,k	f,j
5. To develop the bioproducts using various bio techniques to solve the problems faced in the real life world	n,k,e	a,b,c,m,g	j,k

H: high correlation, M: medium correlation, L: low correlation

Draft Lecture Schedule

Session	Topics	Problem solving (Yes/No)	Text / Chapter
UNIT I INTRODUCTION TOLIFE			
1.	Characteristics of living organisms and its classification	No	[T1, R2]
2.	Cell theory	No	
3.	Prokaryotic and eukaryotic cells	No	
4.	Biomolecules and its types with functions	No	
UNIT II BIODIVERSITY			
5.	Basic concepts in plant system	No	[T1, T2 & R3]
6.	Mechanisms in photosynthesis and nitrogen fixations	No	
7.	Basic concepts in animal system	No	
8.	Study of various systems and its functions	No	
9.	Basic concepts in the microbial systems	No	
10.	Types of microbes and its economic importance	No	
UNIT IV HUMAN DISEASES			
11.	Causes, symptoms, diagnosis, treatment and prevention of diabetes	No	[T2 &R2]
12.	Cancer	No	
13.	Hypertension	No	
14.	Influenza	No	
15.	AIDS	No	
16.	Hepatitis	No	
UNIT V BIOLOGY AND ITS INDUSTRIAL APPLICATIONS			
17.	Transgenic plants and animals	No	[T3, R1 & R3]
18.	Stem cell and tissue engineering	No	
19.	Bioreactors , biopharming	No	
20.	Recombinant vaccines, cloning and drug discovery	No	
21.	Neural networks	No	
22.	Bioremediation,biofertilizers biocontrol, biosensors	No	
23.	Biofilters, biosensors, biopolymers,bioenergy, biochips, biomaterials	No	
24.	Biomedical instrumentation	No	

Teaching Strategies

The teaching in this course aims at establishing a good fundamental understanding of the areas covered using:

- Formal face-to-face lectures
- Tutorials, which allow for exercises based on grammar and allow time for students to come up with the answers after understanding the grammatical rules.
- Writing sessions, which support the formal lecture material and also provide the student with listening, speaking, reading and writing skills.
- Group discussions and seminar to enhance the speaking skills.

Evaluation Strategies

Cycle Test – I	-	5%
Cycle Test – II	-	5%
Model Test	-	5%
Assignment	-	5%
Attendance	-	10%
Final exam	-	70%

Prepared by: Mr.Pradeep saravanan, Assistant professor **Dated :**

Addendum

ABET Outcomes expected of graduates of B.Tech /Civil / program by the time that they graduate:

(a) an ability to apply knowledge of mathematics, science, and engineering

(b) an ability to design and conduct experiments, as well as to analyze and interpret data

(c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability

(d) an ability to function on multidisciplinary teams

(e) an ability to identify, formulate, and solve engineering problems

(f) an understanding of professional and ethical responsibility

(g) an ability to communicate effectively

(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context

(i) a recognition of the need for, and an ability to engage in life-long learning

(j) a knowledge of contemporary issues

(k) an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Program Educational Objectives

PEO1: PREPARATION

Civil Engineering graduates will have knowledge to apply the fundamental principles for a successful profession and/or for higher education in Civil Engineering based on mathematical, scientific and engineering principles, to solve realistic and field problems that arise in engineering and non engineering sectors

PEO2: CORE COMPETENCE

Civil Engineering graduates will adapt to the modern engineering tools and construction methods for planning, design, execution and maintenance of works with sustainable development in their profession.

PEO3: PROFESSIONALISM

Civil Engineering Graduates will exhibit professionalism, ethical attitude, communication and managerial skills, successful team work in various private and government organizations both at the national and international level in their profession and adapt to current trends with lifelong learning.

PEO4: SKILL

Civil Engineering graduates will be trained for developing soft skills such as proficiency in many languages, technical communication, verbal, logical, analytical, comprehension, team building, inter personal relationship, group discussion and leadership skill to become a better professional.

PEO5: ETHICS

Civil Engineering graduates will be installed with ethical feeling, encouraged to make decisions that are safe and environmentally-responsible and also innovative for societal improvement.

Course Teacher	Signature
Ms.Priya	

Course Coordinator **HOD/Civil**