

Academic Course Description

BHARATH UNIVERSITY
 Faculty of Engineering and Technology
 Department of Electrical and Electronics Engineering
BBT201 BIOLOGY FOR ENGINEERS
Second Semester (Even 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 hoursn : 2 and 30 hours

Course Coordinator : Ms.Priya, Asst. Professor

Instructors : Ms.Priya

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	04422290125		9.00-9.50 AM

Relationship to other courses:

Pre –requisites : 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.

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	February 1 st week	Session 1 to 12	2 Periods
2	Cycle Test-2	March 1 st week	Session 13 to 24	2 Periods
3	Model Test	April 2 nd week	Session 1 to 30	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 TO LIFE			
1.	Characteristics of living organisms and its classification	No	[T1, R2]
2.	Cell theory	No	
3.	Prokaryotic and eukaryotic cells	No	
4.	Prokaryotic and eukaryotic cells	No	
5.	Biomolecules and its types with functions	No	
6.	Biomolecules and its types with functions	No	
UNIT II BIODIVERSITY			
7.	Basic concepts in plant system	No	[T1, T2 & R3]
8.	Mechanisms in photosynthesis and nitrogen fixations	No	
9.	Basic concepts in animal system	No	
10.	Study of various systems and its functions	No	
11.	Basic concepts in the microbial systems	No	
12.	Types of microbes and its economic importance	No	
UNIT III GENETICS AND IMMUNE SYSTEM			
13.	Evolution: theories of evolution-Mendel's cell division	No	
14.	mitosis and meiosis-evidence of e laws of inheritance	No	
15.	variation and speciation	No	
16.	nucleic acids as a genetic material	No	
17.	central dogma immunity	No	
18.	antigens-antibody-immune response.	No	
UNIT IV HUMAN DISEASES			
19.	Causes, symptoms, diagnosis, treatment and prevention of diabetes	No	
20.	Cancer	No	
21.	Hypertension	No	

22.	Influenza	No	[T2 &R2]
23.	AIDS	No	
24.	Hepatitis	No	
UNIT V BIOLOGY AND ITS INDUSTRIAL APPLICATIONS			
25.	Transgenic plants and animals, Stem cell and tissue engineering	No	[T3, R1 & R3]
26.	Bioreactors , biopharming, Recombinant vaccines	No	
27.	cloning and drug discovery, Neural networks	No	
28.	Bioremediation, biofertilizers, biocontrol, biosensors	No	
29.	Biofilters, biosensors, biopolymers, bioenergy, biochips, biomaterials	No	
30.	Biomedical instrumentation	No	

Teaching Strategies
The teach

ing 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	-	10%
Assignment	-	5%
Attendance	-	5%
Final exam	-	70%

Prepared by: Mrs. Priya, Assistant professor

Dated :

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

- a) An ability to apply knowledge of mathematics, science, and engineering fundamentals.
- b) An ability to identify, formulate, and solve engineering problems.
- c) An ability to design a system, component, or process to meet the desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- d) An ability to design and conduct experiments, as well as to analyze and interpret data.
- e) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
- f) An ability to apply reasoning informed by the knowledge of contemporary issues.
- g) An ability to broaden the education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
- h) An ability to understand professional and ethical responsibility and apply them in engineering practices.
- i) An ability to function on multidisciplinary teams.
- j) An ability to communicate effectively with the engineering community and with society at large.
- k) An ability in understanding of the engineering and management principles and apply them in project and finance management as a leader and a member in a team.
- l) An ability to recognize the need for, and an ability to engage in life-long learning.

Program Educational Objectives**PEO1: PREPARATION**

Electrical Engineering Graduates are in position with the knowledge of Basic Sciences in general and Electrical Engineering in particular so as to impart the necessary skill to analyze and synthesize electrical circuits, algorithms and complex apparatus.

PEO2: CORE COMPETENCE

Electrical Engineering Graduates have competence to provide technical knowledge, skill and also to identify, comprehend and solve problems in industry, research and academics related to power, information and electronics hardware.

PEO3: PROFESSIONALISM

Electrical Engineering Graduates are successfully work in various Industrial and Government organizations, both at the National and International level, with professional competence and ethical administrative acumen so as to be able to handle critical situations and meet deadlines.

PEO4: SKILL

Electrical Engineering Graduates have better opportunity to become a future researchers/ scientists with good communication skills so that they may be both good team-members and leaders with innovative ideas for a sustainable development.

PEO5: ETHICS

Electrical Engineering Graduates are framed to improve their technical and intellectual capabilities through life-long learning process with ethical feeling so as to become good teachers, either in a class or to juniors in industry.

Course Teacher	Signature
Mrs.Priya	

Course Coordinator

(Mrs.Priya)

HOD/EEE

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