

BHARATHIAR UNIVERSITY, COIMBATORE
B.Sc. BIOTECHNOLOGY DEGREE COURSE
SCHEME OF EXAMINATION - CBCS PATTERN

For the students admitted during the academic year 2015– 2016 batch onwards

Part	Study Components	Course title	Ins. hrs/ week	Examinations				Credit
				Dur.Hrs.	CIA	Marks	Total Marks	
	Semester I							
I	Language – I		6	3	25	75	100	4
II	English – I		6	3	25	75	100	4
III	Core Paper I - Cell biology		4	3	25	75	100	4
	Core Paper II - Bioinstrumentation		4	3	25	75	100	4
	Practical I (Cell Biology, Bioinstrumentation and Microbiology)		2	-	-	-	-	-
	Allied A : Chemistry I		4	3	20	55	75	3
	Allied Practical		2	-	-	-	-	-
IV	Environmental Studies #		2	3	-	50	50	2
	Semester II							
I	Language – II		6	3	25	75	100	4
II	English – II		6	3	25	75	100	4
III	Core Paper III – Microbiology		5	3	25	75	100	4
	Core Practical I (Cell Biology, Bioinstrumentation and Microbiology)		4	3	40	60	100	4
	Allied A : Chemistry II		4	3	20	55	75	3
	Allied Practical (Chemistry)		3	3	20	30	50	2
IV	Value Education – Human Rights #		2	3	-	50	50	2
	Semester III							
I	Language – III		6	3	25	75	100	4
II	English – III		6	3	25	75	100	4
III	Core Paper IV - Biochemistry		4	3	25	75	100	4
	Core Paper V- Genetics		4	3	25	75	100	4
	Core Practical II (Genetics & Biochemistry)		2	-	-	-	-	-
	Allied B: Paper I – Basic Mathematics		3	3	20	55	75	3
IV	Skill based Subject 1 - Human Physiology		3	3	20	55	75	3
	Tamil @ / Advanced Tamil# (OR) Non-major elective - I (Yoga for Human Excellence# / Women's Rights#/ Constitution of India #)		2	3	50		50	2
	Semester IV							
I	Language – IV		6	3	25	75	100	4
II	English – IV		6	3	25	75	100	4
III	Core Paper VI- Molecular Genetics		4	3	25	75	100	4
	Core Practical – II (Genetics & Biochemistry)		3	3	40	60	100	4
	Allied B : Paper II – Computer applications		4	3	20	55	75	3
	Allied Practical (Computer applications))		2	3	20	30	50	2

IV	Skill based Subject 2 -Human Pathology	3	3	20	55	75	3
	Tamil @ /Advanced Tamil # (OR) Non-major elective -II (General Awareness#)	2	3	50		50	2
	Semester V						
III	Core paper VII Plant & Animal Biotechnology	4	3	25	75	100	4
	Core Paper VIII Immunology	4	3	25	75	100	4
	Core Paper IX environmental biotechnology	4	3	25	75	100	4
	Core Paper X Recombinant DNA Technology	4	3	25	75	100	4
	Core Practical III Immunology and Plant Tissue Culture	4	-	-	-	-	-
	Core Practical IV Microbial Biotechnology & rDNA technology	3	-	-	-	-	-
	Elective 1	4	3	25	75	100	4
IV	Skill based Subject 3 Diagnostic tools	3	3	20	55	75	3
	Semester VI						
III	Core Paper XI – Microbial Biotechnology	5	3	25	75	100	4
	Core Practical III- Immunology and Plant Tissue Culture	6	3	40	60	100	4
	Core Practical IV Microbial Biotechnology & rDNA technology	6	6	40	60	100	4
	Elective – II	5	3	20	55	75	3
	Elective – III	5	3	20	55	75	3
IV	Skill Based Subject 4 - Pharmacology	3	3	20	55	75	3
V	Extension Activities @	-	-	50	-	50	2
	Total					3500	140

@ No University Examinations. Only Continuous Internal Assessment (CIA)

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List of Elective papers (Colleges can choose any one of the paper as electives)		
Elective – I	A	Agricultural Biotechnology
	B	Bioremediation
	C	Introduction to Bioinformatics
Elective – II	A	Medical Biotechnology
	B	Biotechnological approach for waste water treatment
	C	Genomics
Elective - III	A	Industrial Biotechnology
	B	Bioethics & Biosafety
	C	Proteomics

Note :

The syllabus for the above papers (except Practical I, II, Core paper III and Core Paper V) be the same. The Syllabus for the Practical I, II, Core paper III and Core Paper V are furnished below:

CORE PRACTICAL I
(CELL BIOLOGY, BIOINSTRUMENTATION AND MICROBIOLOGY)

1. Laboratory rules and regulations.
2. Microscopy
3. Cell Types - Microbial, animal and Plant cells
4. Identification of lymphocytes.
5. Fraction of Cellular components
6. Preparation of Buffer- Phosphate, Acetate, Tris.
7. Determination of OD using - Colorimeter, Spectrophotometer and pH.
8. Media preparation and sterilization
9. Enumeration of microorganism – Spread and Pour
10. Pure culture technique – Streaking techniques
11. Measurement of growth of bacteria.
12. Staining of microorganisms – Gram, negative, acid fast, spore and fungal(LCB)
13. IMVIC test
14. Carbohydrate fermentation test, TSI, H₂S production test
15. Antibiotic sensitivity test
16. Permanent Slide preparation
17. Hanging Drop Technique

CORE PRACTICAL II
(GENETICS & BIOCHEMISTRY)

1. Drosophila – Morphology, Section culture and maintenance.
2. Identification of Mutants - Physical and Chemical Methods.
3. Experiments to determine Mendel's law.
4. Monohybrid and dihybrid cross using plants.
5. Sex chromatin (Buccal smear)
6. Paper Chromatography.
7. Thin layer chromatography.
8. Mitotic Preparation - Onion Root Tip.
9. Meiotic preparation- Grasshopper
10. Estimation of Protein - Lowry's method.
11. Estimation of DNA by DPA Method
12. Estimation of RNA by Orcinol method
13. Estimation of Sugars by Anthrone method
14. Estimation of total free amino acids - Sulfovanicillin method.
15. Estimation of Lipids
16. Analysis of Oils- Iodine Number- Saponification Value -Acid Number.
17. Quantification of Vitamin C.

CORE PAPER: III
Subject Title: MICROBIOLOGY

Subject description: This course presents the study of Micro organisms.

Goals: To make the student to understand Micro organisms and their participation in day to day activities.

Objectives: On successful completion of the subject the student should have understood the Role of microorganisms in the diversity

UNIT I:

Definition and scope of microbiology-- A general account on microbial diversity. Basic principles in microscopy, Types of microscopes- light, dark, phase contrast, fluorescent and electron microscope- (Transmission and Scanning electron)

UNIT II:

A detailed account of General structure, growth and reproduction of Bacteria, fungi and Virus. Economic and industrial importance of yeast and moulds.

UNIT III:

Microbiological Media: Types, preparation, methods of sterilization; enumeration of microorganisms in soil, water and air; isolation of microorganisms from Environment and infected tissue; Techniques of pure culture, maintenance and Preservation; Staining: stains and types of staining;

UNIT IV:

Physiology and biochemistry of microbes- Photo-autotrophs, Chemo-autotrophs, Parasitism, Saprophytism, Mutualism and Symbiosis, Commensalisms, endozoic microbes.

UNIT V:

Nitrogen metabolism including Nitrogen fixation (Symbiotic and asymbiotic), Lipid metabolism, Secondary metabolism, microbial pathogens of plants (TMV, Gemini virus), animals (Yersinia pestis, rabies) and humans (HIV, HSV), Role of microbes in biogeochemical cycles.

REFERENCES:

1. Michael T. Madigan John M. Martin & Jack Parker, 1984, Biology of Microorganisms Prentice Hall International, Inc., London.
2. Edward A. Birge, 1992, Modern Microbiology – Principles and application. Wm.C. Brown Publishers, Inc. U.S.A.
3. Gerard J. Tortora, Berdell R. Funke, Christine & L. Case, 2001, Microbiology - An Introduction. Benjamin Cummings, U.S.A.
4. Danial Lim, 1998, Microbiology, McGraw-Hill Companies, New York.
5. Stephen A. Hill, 1984, Methods in Virology. Blackwell Scientific Publication, London.

CORE PAPER: V
Subject Title: GENETICS

Subject description: This course presents the way characters get transferred through generations and methods to analyze and modify them

Goals: To make the student to understand the concept of genes and their behaviour

Objectives: On successful completion of the subject the student should have understood:

Basic genetics and their role

UNIT I

History of Genetics - Mendelian Principles, Segregation, Independent Assortment, Dominance. Multiple alleles, Pseudo alleles, Incomplete dominance, Over dominance and co dominance, complementation test.

UNIT II

Gene interaction, Epistasis, penetrance and expressivity, lethality and lethal genes. Sex determination and sex linkage in diploids, linkage and crossing over, gene mapping. Chromosomal theory of inheritance, maternal effects.

UNIT III

Chromosomal variation in number, Changes in Chromosomal structure, Chromosomal aberrations, Genetics of Hemoglobin, Transposable elements in prokaryotes and eukaryotes.

UNIT IV

Structure of chromosome, fine structure of Gene, cistron, recon, Structure of Eukaryotic gene, Experimental evidence for DNA as the genetic material, cytoplasmic genetic systems- mitochondria and chloroplast DNA.

UNIT V

Genetic control of Development in Drosophila and Arabidopsis.
Population genetics, calculating gene frequency, factors affecting gene frequency.
Genetic drift, Shift, Pedigree analysis and genetic counselling.

REFERENCES:

1. Basic genetics by D.L.Hartl, 1991, Jones and Bartlett public.
2. Friedfelder 1987, Microbial genetics, Jones and Bartlett public.
3. Molecular Biology of the genes 4th Ed. Watson et.,al, the Benjamin /Cummings coins 1987
4. Molecular by cell biology, 1994.Lodish, Baltimore scientific American books,Inc.
5. Genetics Strickberger.M
6. Genetics by Goodenough