AKKAMAHADEVI WOMEN'S UNIVERSITY, VIJAYAPUR.

B. SC. SEMESTER COURSE

BIOTECHNOLOCY (UG) SYLLABUS FOR THE ACADEMIC YEAR 2018-19 ONWARDS

Course Structure:

1.1. Cell Biology and Cytogenetics

1.2. Biochemistry

1.3. Microbiology and Immunology

1.4. Molecular Biology

1.5. Genetic Engineering

1.6. Plant and Animal Biotechnology

1.7. Agricultural and Environmental Biotechnology

1.8. Industrial and Medical Biotechnology

AKKAMAHADEVI WOMEN'S UNIVERSITY, VIJAYAPURA

B.Sc DEGREE (SEMESTER) COURSE IN BIOTECHNOLOGY

SCHEME OF TEACHING AND EXAMINATION

(W.E.F 2018-19 ONWARDS)

Paper	Teaching Hrs Per Week	Examination		Internal Assessment
		Hrs.	Marks	
SEMESTER 1: Optional 1.1 CELL BIOLOGY AND CYTOGENETICS PRACTICAL	4 6	3 3	60 20	10 10
SEMESTER2: Optional 2.1 BIOCHEMISTRY PRACTICAL	4 6	3 3	60 20	10 10
SEMESTER3: Optional 3.1 MICROBIOLOFY AND IMMUNOLOGY PRACTICAL	4 6	3 3	60 20	10 10
SEMESTER4: Optional 4.1 MOLECULAR BIOLOGY PRACTICAL	4 6	3 3	60 20	10 10
TOTAL MARKS 1 TO 4 SEMESTER				400

BSC I SEMESTER BIOTEHNOLOGY

CELL BIOLOGY AND CYTOGENETICS

Subject code	BSBT 01	IA Marks	10
No of Lectures	O4	Exam Hours	03
Total No of Lectures Hours	56	Exam marks	60

UNIT –I:General Introduction:

Historical perspectives, cell theory, ultra structure of plant and animal cell. Different types of cells. 08 hrs

UNIT-II:Cell organelles:

Ultra structure of cell wall, Cell membrane, Cytosol, Golgi bodies, Endoplasmic Reticulum .Ribosome, Mitochondria, Lysosomes, Chloroplast, Nucleus & Cytoskeleton structures 08 hrs

UNIT-III:Cell division:

Cell Cycle and regulation. Mitosis and Meiosis - different stages of cell division. Gametogenesis, spermatogenesis & oogenesis. 08 hrs

UNIT-IV:Chromosomes:

Discovery, Morphology and structural organization – Centromere, Secondary constriction, Telomere, Chromonema, Euchromatin and Heterochromatin, Karyotype. Ultrastructure of chromosome,nucleosome models.Special type of chromosomes:Salivarygland and Lampbrushchromosmes 08 hrs

UNIT-V -Mendelism:

Introduction to Mendel's work, laws of heredity, incomplete dominance & simple biostatistic problems. 08 hrs

UNIT-VI- Mutations-

Types: Spontaneous and induced, Mutagens: Physical and chemical, Mutation at the molecular level, Mutations in plants, animals and microbes for economic benefit of man.

08 hrs

UNIT-VII -Human genetics:

Karyotype in man, inherited disorders- allosomal (Kleinfilter's syndrome, Turner's syndrome) autosomal (Down's & criduechat syndrome). Sex determination -Concept of allosomes & autosomes, xx-xy, xx-xo, zw-zz, zo-zz types. 08 hrs

REFERENCES:

1. De-Robertis, E. D. P. and Robertis, E. M. S. 1996: Cell and Molecular Biology, Holt Saunders International.

2. Lodish, H. Berk, A. Zipursky, S. L. Matsiduvaria, P. Baltimore, D. Darnell, J. 2000: Molecular Cell Biology, Freeman W. H. and Co. New York.

3.Singh, H. R. 2000: Animal Physiology and related biochemistry, S. Loban Lal Nagin Chand and Co. Educational Publishers, New Delhi.

4.Sandhya Mitra, "Genetics – Blue print of life", Tata Mc. Graw Hill Publications.

5.Strickberger, M. W. 1995: Genetics, 3rd Ed. Prentice Hall Inc. London.

6.Tamarin, R. M. 2000: Principles of Genetics. 6th Ed., WMC Publ. Co. London. Winchester Sinnot and Dorm, "Principles of Genetics".

BSC I SEMESTER BIOTEHNOLOGY

PRACTICAL: CELL BIOLOGY & CYTOGENETICS

Subject code	**BSPR 01**	**IA Marks**	**10**
No of Lectures	O6 hrs	Exam Hours	03
Total No of Lectures Hours	16 hrs	Exam marks	20

1) Laboratory rules & regulations observed in biotechnology lab.
2) Study & operation of microscopes.
3) Isolation of protozoa from soil & water.
4) Study of fixatives & stains: preparation of formal dehyde, (4-10%), alcohol (70-100%), bouin's fixative, carnoy's solution, Borax Caramine (alcoholic) eosin (alcoholic), Iron (Haematoxylin), acetocaramine, Aecto orcin, Schiff's reagent (Fulgen method), Giemsa stain.
5) Squash preparation of onion root tips to study the stages of Mitosis.
6) Study the stages of meiosis.
7) Cell counting methods- Haemocytometer.
8) Buccal epithelial smear & Barr body.
9) Demonstration of law of inheritance by solving genetic problems.
10) Karyotype study

BSC II SEMESTER BIOTEHNOLOGY

BIOCHEMISTRY

Subject code	BSBT 02	IA Marks	10
No of Lectures	O4	Exam Hours	03
Total No of Lectures Hours	56	Exam marks	60

UNIT-I:Introduction: 08 hrs

Physical and chemical nature of biological materials. Types of chemical bonds and their functions.

UNIT-II:Carbohydrates: 08 hrs

Classification, properties, functions of monosaccharides, di and polysaccharide.

UNIT-III:Proteins: 08 Classification, structure, properties of amino acid, biological functions of proteins, primary, secondary, tertiary and quaternary structures

UNIT-IV:LIPIDS: 08 hrs

Classification, structure, properties and functions lipids

UNIT-V:Enzymes: 08 hrs

Classification, properties, factors influencing enzyme catalyzed reactions, and enzyme kinetics. Industrial applications of enzymes.

UNIT-VI:Nucleicacids: 08 hrs

Classification, structure & chemical properties of DNA and fuctions. RNA- types and functions.

UNIT-VII:Analytical techniques (Principles and Applications): 08 hrs

Chromatography, Spectraphotometer, Centrifugation & Electrophoresis, , Radioactivity.

REFERENCES: BIOCHEMISTRY

1.Deb, A. C., "Fundamentals of Biochemistry", New Central Book Agency, Calcutta.

2.Jain, J. L. "Fundamental of Biochemistry", S. Chand and Company.

3.Lehninger, et al., 1997: Principles of Biochemistry CBS Publishers. Mathews and Van Horde: Moron, L. A. Seeimgeour, K. G. Hostan, H. R., Ochs, R. S. and Rawn, J. D. 2000: Biochemistry, 3rd Edition Neil Patterson Publishing prentice. Hall, New York.

4.Narayanan, P. 2000, "Essentials of Biophysics", New age Intl. Publications, New Delhi.
Plumer, David, T. 1988 "Introduction to practical biochemistry". New Delhi, Tata McGraw Hill Publishing Company.

5.Roy R. N. 1999, "Text book of Biophysics", New Central book agency.

6.Voet, D. and Voet, J., 2000 "Biochemistry", John Wiley and Sons, London.

7.Wilson, K. and Walker, J. 1995. "Practical Biochemistry Principles and Techniques".

BSC II SEMESTER BIOTEHNOLOGY

PRACTICAL: BIOCHEMISTRY

Subject code	**BSPR 01**	**IA Marks**	**10**
No of Lectures	O6 hrs	Exam Hours	03
Total No of Lectures Hours	16 hrs	Exam marks	20

1) Preparation of percent molarity, molality & normality of solution, measument of pH & buffers.
2) Qualitative analysis of carbohydrates.
3) Qualitative analysis of proteins.
4) Qualitative analysis of lipids.
5) Paper chromatography of amino acids, sugars and plant pigments.
6) Assay of amylase activity.
7) Colorimeter estimation of protein by biuret / Lowry's method.
8) Colorimetric estimation of sugar.
9) Quantitative estimation of amino acids.
10) Demonstration of catalase activity.
11) Estimation of fatty acid content in oil by titration method.