CURRICULUM FOR BIOTECHNOLOGY
IN UNDER GRADUATE DEGREE PROGRAMME

CBCS SYLLABUS SCHEDULE 2016 – 2017

By

Chairperson,
Board of Studies,
Department of Biotechnology,
Kakatiya University,
Warangal

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1	Semester	Course category	Title of the Paper	No. of Credits	HPW	I.A	End Exam	Total	Total Marks
FIRST YEAR									
BS104	I	DSC-1A (Theory)	Cell Biology & Genetics	4	4	20	80	100	125
		DSC-1A (Practical)		1	2	-	25	25	
BS204	II	DSC-1B (Theory)	Nucleic Acids- Biostatistics - Bioinformatics	4	4	20	80	100	125
		DSC-1B (Practical)		1	2	-	25	25	
SECOND YEAR									
BS304	III	DSC-1C (Theory)	Biological Chemistry	4	4	20	80	100	125
		DSC-1C (Practical)		1	2	-	25	25	
		SEC - I	Computer Basics and Automation	2	2	-	50	50	50
BS404	IV	DSC-1D (Theory)	Microbiology and Immunology	4	4	20	80	100	125
		DSC-1D (Practical)		1	2	-	25	25	
		SEC - II	Multimedia and Applications	2	2	-	50	50	50
THRID YEAR									
BS502	V	GE-1 (Theory)	Public Health and Hygiene (Interdisciplinary)	4	4	-	100	100	150
		GE-1		-	-	50	-	50	
BS503		DSC-1E (Theory)	Molecular Biology & rDNA Technology	3	3	15	60	75	100
		DSC-1E (Practical)		1	2	-	25	25	
BS506		DSC-1F (Theory)	Subject Electives: A- Plant Biotechnology or B- Medical Biotechnology	3	3	15	60	75	100
		DSC-1F (Practical)		1	2	-	25	25	
		SEC - III	Verbal Reasoning For Aptitude Test	2	2	-	50	50	50
BS602	VI	GE-2 (Theory)	Water Resources Management (Interdisciplinary)	4	4	-	100	100	150
		GE-2		-	-	50	-	50	
BS603		DSC-1G (Theory)	Microbial Biotechnology	3	3	15	60	75	100
		DSC-1G (Practical)		1	1	-	25	25	
BS606		DSC-1H (Theory)	Subject Electives: A-Animal Biotechnology or B- Environmental Biotechnology	3	3	15	60	75	100
		DSC-1H (Practical)		1	1	-	25	25	
BS601		SEC- IV	Quantitative Aptitude Test	2	2	-	50	50	50
Summary of Credits				**56**		-	-	-	**1400**

PAPER-II
NUCLEIC ACIDS- BIOSTATISTICS – BIOINFORMATICS

UNIT- I : Structure of Nucleic Acids

1.1   DNA as the genetic material – Griffiths experiments, Avery, Mc Leod and Mc Carty's experiments. Hershey – Chase experiments.

1.2   RNA as genetic material – Tobacco Mosaic Virus

1.3   Structure and chemistry of DNA – Watson and Crick Model

1.4   Forms of DNA – A, B and Z forms of DNA, Super coiled and relaxed DNA – Role of DNA topoisomerases.

1.5   Structure of Cytoplasmic DNA – chloroplast DNA and Mitochondrial DNA.

UNIT- II : Functions & Mechanisms of Nucleic Acids

2.1   DNA Replication – Models of DNA replication (Semi-conservative, non-conservative models)

2.2   Mechanisms of DNA replication – Linear and circular – Rolling circle and theta mechanism of
replication. Enzymes involved in DNA replication.

2.3 Mutation- spontaneous, induced- Physical and chemical (frame shift, transition, transversion)

2.4 DNA damage and Repair mechanisms

2.5 DNA Recombination

UNIT- III : Concepts of Biostatistics

3.1 Concept of probability, basic laws and its application to Mendelian segregation. Concept of Probability Distribution. Binomial and Poisson Distributions, Normal Distribution and their application in Biology

3.2 Concept of Sampling and Sampling Distribution. Measures of Central tendency (Mean, Median, Mode), Measures of deviation (Strandard deviation, variance and coefficient of variation).

3.3   Concept of Test of Hypothesis. Applications of t-test statistics to biological problems/data: Chi-square, statistic applications in Biology

3.4 Simple Regression and Correlation.

3.5 Concept of analysis of variance (one-way classification)

UNIT- IV   Concepts of Computers & Bioinformatics

4.1 Usage of MS DOS commands: Basic concept of Internal & External commands, directory &
file commands, copying, erasing, renaming, and displaying files.

4.2 Microsoft word: Concept of toolbar, character, paragraph & document formatting, drawing
tool bar, header, footer, document editing, page setup, short cut keys, text & graphics.

4.3 Microsoft power point: Slide presentation, slide layout & design, custom animation, image

importing, slide transition.

4.4 Bioinformatics - Databases – (Nucleic acid and protein), Introduction to genomics and proteomics.

4.5. Data retrieval toos – (BLAST, PubMED)

Practical Paper - II

1. Estimation of DNA by diphenylamine method
2. Estimation of RNA by orcinol method
3. Finding statistical significance of a given data using chi – square test.
4. Graphical representation of data (Histograms, frequency polygen, Pie diagram)
5. Acquaintance with the Biological databases through Internet
6. Micro soft Power point presentation.

Spotters :

1. TMV
2. B-DNA
3. Z-DNA
4. Replication fork
5. Okazakifragment
6. SOS repair
7. Probability theorems
8. Test of hypothesis
9. F-test
10. Biological databases
11. NCBI
12. BLAST

Recommended Books

1. Molecular Biology - Freifelder
2. Cell & Moelcular Biology – Schwann Series
3. Cell and Molecular Biology - By De Robertis
4. Cell and Molecular Biology - By Lodish
5. Basics in Computers – MS office
6. Biometry - By Sokal and Rohlf W.H. Freeman
7. Fundamentals of Biometry - By L.N. Balaram (George Allen and Unwin Ltd, London
8. Biostatistics - By N.T.J. Bailey
9. Biostatistics- Manual of biostatistical methods for use in health, nutrition and Anthropology - By K. Visweshwar Rao (Jaypee Publications).
10. Bioinformatics and Bioprogramming in C - By L.N. Chavali
11. Introduction to Bioinformatics - By V. Kothekar
12. Introduction to Bioinformatics - By Arthur M. Lesk