

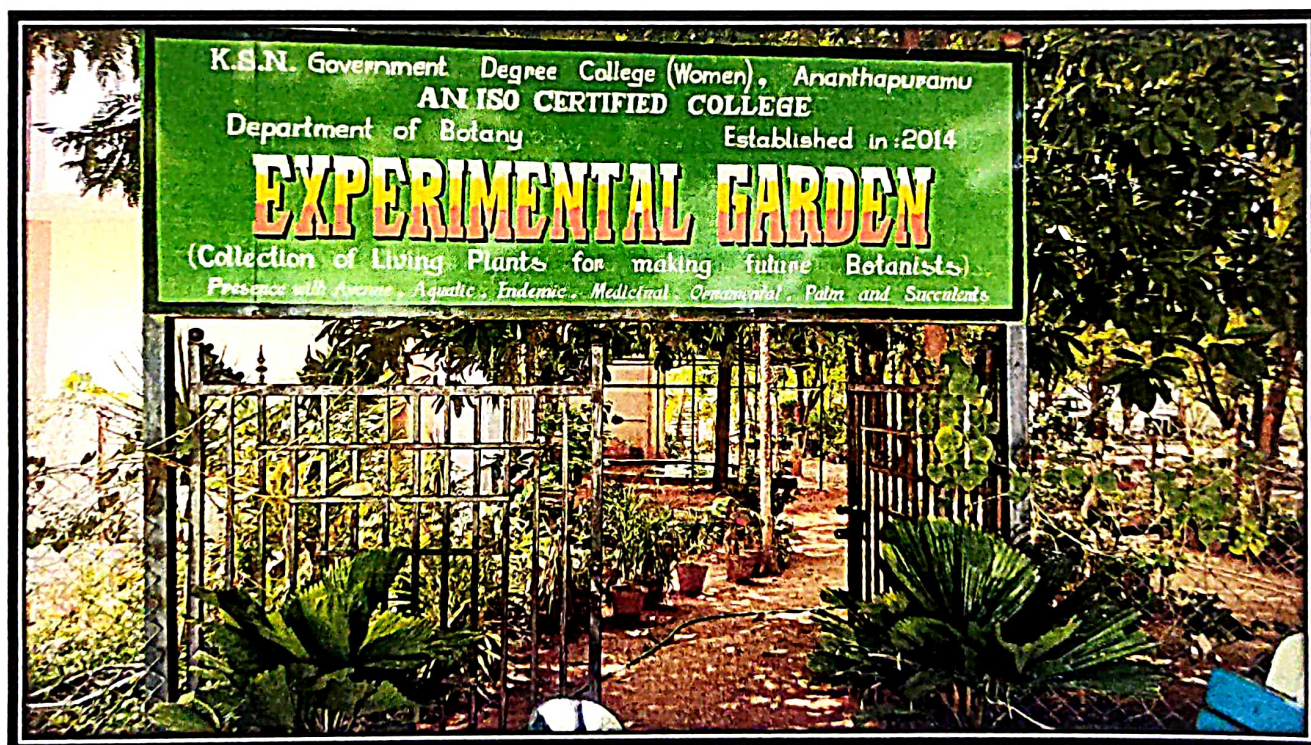
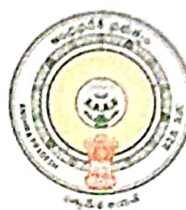
**K S N GOVERNMENT DEGREE COLLEGE FOR WOMEN**  
**(AUTONOMOUS)**  
**ANANTHAPURAM**

(Affiliated to Sri Krishnadevaraya University, Anantapur)

Reaccredited by NAAC at "A" Grade

**BOARD OF STUDIES IN BOTANY**

**2023 - 2024**



**B.Sc., Degree Course Curriculum under CBCS Pattern**

**Academic Year: 2023-2024**

**Subject: BOTANY FIRST YEAR**

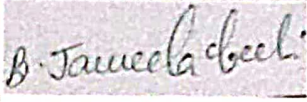

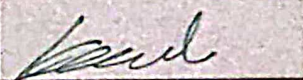
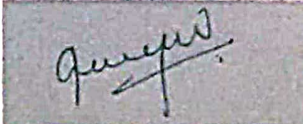
**Semester -I**

**Date: 10-10-2023**



## Consolidated Report of Board of Studies for the Academic Year 2022-2023

Board of studies meeting is convened on 10 October 2023 under the chairmanship of Dr. SRK. Neeraja to approve the syllabus crafted for the Undergraduate Course Pathway Courses for Semester I of the 2023-24 Academic Year. The following individuals are listed as members.

S No	Name	Mail id & Mobile number	Signature
1	Dr. SRK. Neeraja Lecturer In Charge Department of Zoology KSN. Govt. Degree College for Women (A) Ananthapuramu.	Chairman 9441664772 <a href="mailto:neerajaram09@gmail.com">neerajaram09@gmail.com</a>	
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4	Dr. R. Kamli Naik Lecturer in Zoology Govt. Degree College (M) Kurnool.	Subject Expert 9652208402 <a href="mailto:kamlinaikr@gmail.com">kamlinaikr@gmail.com</a>	
5	Dr. P. Subramanyam Lecturer In Charge Department of Botany SKR & SKR GDC for Women (A) Kadapa	Subject Expert 9490606317 <a href="mailto:subramanyampaluru@gmail.com">subramanyampaluru@gmail.com</a>	
6	Dr. Anusha Lecturer in Chemistry Silver Jubilee GDC Kurnool.	Subject Expert 7798395071 <a href="mailto:anushabheemreddy@gmail.com">anushabheemreddy@gmail.com</a>	
7	Dr. B. Priyadarshini Lecturer in Microbiology SKR & SKR GDC for Women (A) Kadapa.	Subject Expert 9849774906 <a href="mailto:priyadarshinibada@gmail.com">priyadarshinibada@gmail.com</a>	

8	Dr. G. Prasanthi Deputy Superintendent Super specialty Hospital Ananthapuramu.	Representative from Allied area  drprashanthi@gmail.com	
9	Dr. M. Sowgandhika Lecturer. In charge Department of Botany KSN. Govt. Degree College for Women (A) Ananthapuramu.	Faculty Member 9492216670 drsowgandhika@gamil.com	
10	Dr. BV. Ramana Naidu Lecturer in Botany KSN. Govt. Degree College for Women (A) Ananthapuramu.	Faculty Member 9347573296 venkataramananaidubotta @gmail.com	B. Ramana Naidu
11	Smt. S.B. Sujatha Lecturer In charge Department of Chemistry KSN. Govt. Degree College for Women (A) Ananthapuramu.	Faculty Member 9985688436 siruguppasujatha@gmail.com	
12	R. Vimala Lecturer in Zoology KSN. Govt. Degree College for Women (A) Ananthapuramu.	Faculty Member 9030585443 Vimalaroyal123@gmail.com	R. Vimala
13	M. Anusha Lecturer in Zoology KSN. Govt. Degree College for Women (A) Ananthapuramu.	Faculty Member 8096140525 nithyaanu89@gmail.com	M. Anusha
14	O. Manimala Lecturer in Chemistry KSN. Govt. Degree College for Women (A) Ananthapuramu.	Faculty Member 6300525954 ghmanimala01@gmail.com	
15	T. Sairam Lecturer in Microbiology KSN. Govt. Degree College for Women (A) Ananthapuramu.	Faculty Member 8142772057 sairamtalari0000@gmail.com	T. Sairam
16	Kum. D. Indrāja KSN. Govt. Degree College for Women (A) Ananthapuramu	UG Alumni 7569752701	



**Course Frame work for I Semester is as follows**

<b>Languages</b>	English/Telugu/Sanskrit/Hindi
<b>Multi-Disciplinary Courses(Any One)</b> Note: Students are not allowed to choose the courses already undergone at Intermediate level	Principles of Biological Sciences Principles of Chemical Sciences Principles of Physical Sciences Introduction to Social Work Principles of Psychology Indian History
<b>Pathway Courses</b>	Introduction to Classical Biology Introduction to Applied Biology

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## **PATHWAY COURSES**

### **SEMESTER-I**

#### **COURSE 1: INTRODUCTION TO CLASSICAL BIOLOGY**

**Theory**

**Credits: 4**

**5 hrs./week**

#### **Learning objectives**

The student will be able to learn the diversity and classification of living organisms and understand their chemical, cytological, evolutionary and genetic principles.

#### **Learning Outcomes**

1. Learn the principles of classification and preservation of biodiversity
2. Understand the plant anatomical, physiological and reproductive processes.
3. Knowledge on animal classification, physiology, embryonic development and their economic importance.
4. Outline the cell components, cell processes like cell division, heredity and molecular processes.
5. Comprehend the chemical principles in shaping and driving the macromolecules and life processes.

#### **Unit 1: Introduction to systematics, taxonomy and ecology**

Systematics – Definition and concept, Taxonomy – Definition and hierarchy. Nomenclature – ICBN and ICZN, Binomial and trinomial nomenclature.

Ecology – Introduction, Definition of ecosystem, outlines of Food chain, Food web & Ecological pyramids. Levels of Biodiversity and outlines of In situ & Ex situ conservation.

Types of Pollution and Global warming.

#### **Unit 2: Essentials of Botany**

The classification of plant kingdom.

Plant physiological processes (Basics of Photosynthesis, Respiration, Transpiration, phytohormones). Structure of flower – Micro and macro sporogenesis, pollination, fertilization and structure of mono and dicot embryos.

Protocols of Mushroom cultivation, Scope and significance of floriculture and landscaping.

#### **Unit 3: Essentials of Zoology**

The classification of Kingdom Animalia and Chordata.

Animal Physiology – Basics of Organ Systems of Digestion, respiration, circulation and excretion & their functions, Hormones and Disorders.

Developmental Biology – Basic process of development (Gametogenesis & Fertilization)  
Economic Zoology – Scope & Significance of Sericulture, Apiculture, Aquaculture.

#### Unit 4: Cell biology, Genetics and Evolution

Cell theory, Ultrastructure of prokaryotic and eukaryotic cell, cell cycle. Chromosomes and heredity – Structure of chromosomes, concept of gene. Central Dogma of Molecular Biology.  
Origin of life

#### Unit 5: Essentials of chemistry

Definition and scope of chemistry, applications of chemistry in daily life. Branches of chemistry  
Chemical bonds – ionic, covalent, noncovalent – Vander Waals, hydrophobic, hydrogen bonds. Introduction, Scope & Significance of Green chemistry

#### References

1. Sharma O.P., 1993. Plant taxonomy. 2<sup>nd</sup> Edition. McGraw Hill publishers.
2. Pandey B.P., 2001. The textbook of botany Angiosperms. 4<sup>th</sup> edition. S. Chand publishers, New Delhi, India.
3. Jordan E.L., Verma P.S., 2018. Chordate Zoology. S. Chand publishers, New Delhi, India.
4. Rastogi, S.C., 2019. Essentials of animal physiology. 4<sup>th</sup> Edition. New Age International Publishers.
5. Verma P.S., Agarwal V.K., 2006. Cell biology, genetics, Molecular Biology, Evolution and Ecology. S. Chand publishers, New Delhi, India.
6. Sathyanarayana U., Chakrapani, U., 2013. Biochemistry. 4<sup>th</sup> Edition. Elsevier publishers.
7. Jain J.L., Sunjay Jain, Nitin Jain, 2000. Fundamentals of Biochemistry. S. Chand publishers, New Delhi, India
8. Karen Timberlake, William Timberlake, 2019. Basic chemistry. 5<sup>th</sup> Edition. Pearson publishers.
9. Subrata Sen Gupta, 2014. Organic chemistry. 1<sup>st</sup> Edition. Oxford publishers.





## 10. ACTIVITIES:

1. Make a display chart of life cycle of nonflowering plants.
2. Make a display chart of life cycle of flowering plants.
3. Study of stomata
4. Activity to prove that chlorophyll is essential for photosynthesis
5. Study of pollen grains.
6. Observation of pollen germination.
7. Ikebana.
8. Differentiate between edible and poisonous mushrooms.
9. Visit a nearby mushroom cultivation unit and know the economics of mushroom cultivation.
10. Draw the Ultrastructure of Prokaryotic and Eukaryotic Cell
11. Visit to Zoology Lab and observe different types of preservation of specimens
12. Hands-on experience of various equipment – Microscopes, Centrifuge, pH Meter, Electronic Weighing Balance, Laminar Air Flow
13. Visit to Zoo / Sericulture / Apiculture / Aquaculture unit
14. List out different hormonal, genetic and physiological disorders from the society

Dr. R. S. Jaiswal	Dr. R. S. Jaiswal	B. Jaiswal	Dr. R. S. Jaiswal
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# SEMESTER-I

## COURSE 2: INTRODUCTION TO APPLIED BIOLOGY

Theory

Credits: 4

5 hrs/week

### Learning objectives

The student will be able to learn the foundations and principles of microbiology, immunology, biochemistry, biotechnology, analytical tools, quantitative methods, and bioinformatics.

### Learning Outcomes

1. Learn the history, ultrastructure, diversity and importance of microorganisms.
2. Understand the structure and functions of macromolecules.
3. Knowledge on biotechnology principles and its applications in food and medicine.
4. Outline the techniques, tools and their uses in diagnosis and therapy.
5. Demonstrate the bioinformatics and statistical tools in comprehending the complex biological data.

#### Unit 1: Essentials of Microbiology and Immunology

History and Major Milestones of Microbiology; Contributions of Edward Jenner, Louis Pasteur,

Robert Koch and Joseph Lister.

Groups of Microorganisms – Structure and characteristics of Bacteria, Fungi, Archaea and Virus. Applications of microorganisms in – Food, Agriculture, Environment, and Industry

Immune system – Immunity, types of immunity, cells and organs of immune system.

#### Unit 2: Essentials of Biochemistry Biomolecules I – Carbohydrates, Lipids. Biomolecules II – Proteins.

Biomolecules III – Nucleic acids -DNA and

RNA. Definitions of – Anabolism and catabolism.

#### Unit 3: Essentials of Biotechnology

History, scope, and significance of biotechnology. Applications of biotechnology in

Plant, Animal, Industrial and Pharmaceutical sciences.

Environmental Biotechnology – Bioremediation and Biofuels, Biofertilizers

And Biopesticides. Genetic engineering – Definition & Significance of restriction enzymes and cloning vectors; Physical, chemical, and biological methods of gene transfer.

Transgenic plants – Stress tolerant plants (biotic stress – BT cotton, abiotic stress – salt tolerance).

Transgenic animals – Animal and disease models.



#### **Unit 4: Analytical Tools and techniques in biology –**

Applications in forensics – PCR and DNA fingerprinting

Immunological techniques – Immunoblotting and ELISA.

Monoclonal antibodies – Applications in diagnosis and therapy. Eugenics and Euthenics

#### **Unit 5: Biostatistics and Bioinformatics**

Data collection and sampling. Measures of central tendency – Mean, Median, mode.

Measures of dispersion – Range, Standard deviation and Variance.

Introduction, Genomics, Proteomics, types of biological data, biological databases-

NCBI, EBI, Gen Bank; Protein 3D structures,

Accessing Nucleic Acid and Protein databases, NCBI.

#### **REFERENCES**

1. Gerard J., Tortora, Berdell R. Funke, Christine L. Case., 2016. Microbiology: An Introduction. 11<sup>th</sup> Edition. Pearson publications, London, England.
2. Micale, J. Pelczar Jr., E.C.S. Chan., Noel R. Kraig., 2002. Pelczar Microbiology. 5<sup>th</sup> Edition. McGraw Education, New York, USA.
3. Sathyanarayana U., Chakrapani, U., 2013. Biochemistry. 4<sup>th</sup> Edition. Elsevier publishers.
4. Jain J.L., Sunjay Jain, Nitin Jain, 2000. Fundamentals of Biochemistry. S. Chand publishers, New Delhi, India.
5. R.C. Dubey, 2014. Advanced Biotechnology. S. Chand Publishers, New Delhi, India.
6. Colin Ratledge, Bjorn, Kristiansen, 2008. Basic Biotechnology. 3<sup>rd</sup> Edition. Cambridge Publishers.
7. U. Sathyanarayana, 2005. Biotechnology. 1<sup>st</sup> Edition. Books and Allied Publishers pvt. Ltd., Kolkata.
8. Upadhyay, Upadhyay and Nath. 2016. Biophysical Chemistry, Principles and Techniques. Himalaya Publishing House.
9. Arthur M. Lesk. Introduction to Bioinformatics. 5<sup>th</sup> Edition. Oxford publishers.
10. AP Kulkarni, 2020. Basics of Biostatistics. 2<sup>nd</sup> Edition. CBS publishers.

#### **CTIVITIES**

1. Identification of given organism as harmful or beneficial.
2. Observation of microorganisms from house dust under microscope.
3. Finding microorganism from pond water.
4. Visit to a microbiology industry or biotech company.
5. Visit to a waste water treatment plant.
6. Retrieving a DNA or protein sequence of a gene'
7. Performing a BLAST analysis for DNA and protein.

8. Problems on biostatistics.

9. Field trip and awareness programs on environmental pollution by different types of wastes and hazardous materials.

10. Demonstration on basic biotechnology lab equipment.

11. Preparation of 3D models of genetic engineering techniques.

12. Preparation of 3D models of transgenic plants and animals.

[NOTE: In the colleges where there is availability of faculty for microbiology and biotechnology, those chapters need to be handled by microbiology and biotechnology faculty. In other colleges, the above topics shall be dealt by Botany and Zoology faculty]

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B. Jannela Bech

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## PATHWAY COURSES

Suggestions made by the subject Experts of Board of Studies

### Course I: Introduction to Classical Biology

#### Topics Deleted

S No	Unit-I	Name of the topic deleted
1	1.4	Climate change
	3.3	Cleavage and Organogenesis

#### Topics Added

S No	Unit	Name of the topic
1	1.3 1.4	Introduction, Definition of Ecosystem, outlines of Food chain, Food web & Ecological pyramids. Levels of Biodiversity and outlines of In situ and Ex situ conservation. Types of pollution and Global warming.
2	2.3 2.4	Basics of Photosynthesis, respiration, transpiration, phytohormones. Protocols of Mushroom cultivation Scope & Significance of Floriculture and landscaping
3	3.2 3.5	Organ systems of Digestion, Respiration, circulation and excretion Scope and significance of Sericulture, Apiculture and Aquaculture
4	5.5	Introduction, scope and significance of Green Chemistry

### Course II: Introduction to Applied Biology

#### Topics deleted

S No	Unit	Name of the topic
1	2	Amino acids
	3.3	Gene manipulation
2	4.4	Gene therapy
3	5.2 5.3 5.4	Probability & Tests of Significance Sequence alignment Genome Workbenches

#### Topics added

S No	Unit	Name of the topic
1	1.5	Definition and Significance of Restriction enzymes and Cloning vectors
2	4.4	Euthenics

*[Signatures and stamps at the bottom of the page]*

## Panel of Question Paper Setters for Pathway Courses



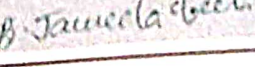

S No	Name of the Question Paper Setter	Designation & Address
1	Dr. P. Subramanyam	Lecturer In charge Department of Botany SKR & SKR GDC for Women(A)Kadapa. 9490606317 <a href="mailto:subramanyampaluru@gmail.com">subramanyampaluru@gmail.com</a>
2	Dr.L. Md. Bakshu	Lecturer in Botany Govt. Degree College Vedurukuppam, Chittoor Dt. 9985415439 <a href="mailto:imbakshu@gamil.com">imbakshu@gamil.com</a>
3.	Dr. B. Bhavani	Lecturer in Botany KVR. Govt. Degree CollegeKurnool 6304608098 <a href="mailto:bhavanibandapalli@gamil.com">bhavanibandapalli@gamil.com</a>
4.	Dr.P. Ravisekhar	Lecturer in Zoology, Govt College for Men (A)Kadapa 9441689606 <a href="mailto:pesala1980@gmail.com">pesala1980@gmail.com</a>
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### Panel list of Examiners for Paper Valuation

S.No	Name of the examiner	Designation & address
1	Dr. P. Giridhar	Lecturer in Zoology Govt. College (A) Ananthapuramu. 9491361743 <a href="mailto:drpgiridhar@gmail.com">drpgiridhar@gmail.com</a>
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11	Dr. C. Madhavi	Lecturer in Microbiology Govt College (A) Ananthapuramu 9963180561 <a href="mailto:sucharithakk@gmail.com">sucharithakk@gmail.com</a>



# BLUE PRINT FOR MODEL QUESTION PAPER




W.e.f. 2023-2024

## SEMESTER END EXAMINATION-I

Max marks: 60

Time: 3 hrs.

S NO	Type of Questions	Marks
1	Multiple Choice Questions	20 X 1 = 20
2	Fill in the blanks	10 X 1 = 10
3	Single phrase questions	10 X 1 = 10
4	Match the following	10 X 1 = 10
5	True or False	10 X 1 = 10
Total Marks		60

  B. K. Srinivas 

S No	Resolution
1	1. Stakeholder Feedback on Syllabus: Collected in the specified format and analyzed
2	2. Approval of Syllabus for UG BSc Course with Zoology as Major: Syllabus is approved after brain storming sessions of Pre BoS and BoS meets.
3.	3. Approval of College-Level Multidisciplinary Courses & pathway courses for biology stream Course frame work for above said courses is approved in the BoS meet conducted by the specified boards
4	4. Approval of Question Paper Blueprint for Examinations Approved in the BoS meet
5	5. Approval of Continuous Internal Evaluation and Assessment Pattern The Continuous internal evaluation format designed by CCE is adhered to and the same is approved by BoS members
6	6. Approval of Practical Examination Patterns Practical examination pattern is approved
7	7. Approval of Panel of Examiners List is provided and the same is approved
8	8. Approval of Panel of Question Paper Setters List is provided and the same is approved
9	Add on / Certificate courses Certificate course on Environmental-friendly biotechnology is approved
10	Action plan Action plan for the current academic year is designed and the same is discussed
11	Results analysis Results analysis of previous year is discussed and the efforts to improve the same are also discussed

*[Signature]*

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## I SEMESTER- I MID EXAM QUESTION PAPER PATTERN

Time: 1 hrs.

Max marks: 20

S NO	Type of Questions	Marks
1	Multiple Choice Questions	3 X 1 = 3
2	Fill in the blanks	5 X 1 = 5
3	Single phrase questions	5 X 1 = 5
4	Match the following	5 X 1 = 5
5	True or False	2X 1 = 2
Total Marks		20

## I SEMESTER - II MID EXAM QUESTION PAPER PATTERN

Time: 1 hr.

Max marks: 15

S NO	Type of Questions	Marks
1	Multiple Choice Questions	4 X 1 = 4
2	Fill in the blanks	3X 1 = 3
3	Single phrase questions	3 X 1 = 3
4	Match the following	3X 1 = 3
5	True or False	2X 1 = 2
Total Marks		15

  B. Jaiswal 

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