SARVODAYA KELAVANI SAMAJ MANAGED,

SHREE MANIBHAI VIRANI & SMT.NAVALBEN VIRANI SCIENCE COLLEGE

AN AUTONOMOUS COLLEGE- AFFILIATED TO SAURASHTRA UNIVERSITY, RAJKOT

Re-accredited at the 'A' Level (CGPA 3.28) by NAAC
'STAR' College Scheme & Status by MST-DBT
A College with Potential for Excellence - CPE (Phase-II) by UGC
UGC-DDU KAUSHAL Kendra
Accredited at the G-AAA Highest Grade 'A-1′ Level by KCG, Govt. of Gujarat
UGC-DDU KAUSHAL Kendra
GPCB-Government of Gujarat approved Environment Audit Centre

Board of Studies (BoS)

Department of Biology

MoM

Academic Year	Meeting Number	Date
2022 - 2023	Tenth	12- 11-2022

Shree Manibhai Virani & Smt. NavalbenViraniScienceCollege, Rajkot

(Autonomous)

Affiliated to SaurashtraUniversity, Rajkot

Department of Biology

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SHREE MANIBHAI VIRANI & SMT. NAVALBEN VIRANI SCIENCE COLLEGE

Affiliated to Saurashtra University, Rajkot

9th Meeting of Board of Studies in Botany / Zoology

Faculty of Science

Department of Biology

Date: 12 / 11 / 2022 Time: 11:00am Venue: Board Room

MINUTES OF THE MEETING

Agenda & notes

AGENDA

1. Introductory remarks by Chairperson
    - Confirmation of MoM & ATR of previous BoS held on 29/04/2022
    - Departmental activities and updates
2. Syllabi of DSE cluster courses offerd for BSc. Microbiology Programme Semester IV.
3. Question paper pattern for DSE cluster courses for Sem.-IV of B.Sc. Microbiology.
4. List of paper setters and examiners for DSE cluster courses for Sem.-IV of B.Sc. Microbiology.
5. Any other agenda with permission of the Chair

BoSMemebers:

Sr. No.	Name	Membership	Present/Absent
1.	Dr. Reena P. Dave	Chairman	Present
2.	Dr. Rahul S. Gohel	Member Secretory	Present
3.	Dr. B. B. Radadia	Member from the Department	Present

4.	Dr. Y. M. Kadiyani	AC nominated subject expert	Present
5.	Dr. NikeshKotadiya	AC nominated subject expert	Present
6.	Dr. AnvayUpathyay	VC Nominated Subject expert	Present
7.	Dr. Manish Vishavadiya	Co-opt member	Present
8.	Dr. Neha T. Patel	Member from the department	Present
9.	Dr. Manish N. Jani	AC nominated subject expert	Present
10.	Dr. R. S. Patel	AC nominated subject expert	Present
11.	Dr. Rutva Dave	VC Nomineted	Present
12.	Dr. B. A. Jadeja	Co-opt member	Present

The chairperson, **Dr. Reena P. Dave**, well-comed all the members of BoS.

Minutes of Meeting:

The Board of Studies in Biology (Botany / Zoology) met as indicated above and discussed on the aforementioned Agenda. Sharing the expertise of all the members and with very proactive inputs, the members unanimously resolved the following:

1. MoM of previous BoS held on 29/04/2022 was confirmed by esteemed members of the board.
2. The Scheme of Learning & Evaluation– DSE cluster Courses for Semester IV of B.Sc. Microbiology programme of the Department were **discussed & framed. (Enclosure–I)**

The above will be effective for students admitted from **AY 2021-22** & onwards

3. The Syllabi for DSE offered to Semester IV of B.Sc. Microbiology programmes of the Department were **discussed & framed.** **(Enclosure - II)**

Discussions:

List of courses where syllabus is modified 20% & more in terms of content

The detailed syllabi in the new format for adoption of OBE indicating course outcomes with K levels, pedagogical & assessment tools as appended.

The above will be effective for students admitted from **AY 2021-22** & onwards

4. List of Paper Setter and Examiner for the 3rd semester courses were discussed and finalized as indicated in **(Enclosure – III)**

5. Question paper pattern for 3rd semester theory & practical courses were discussed and finalized **(Enclosure – IV)**

Sr. No.	Name	Membership	Present/Absent
1	Dr. Reena P. Dave	Chairman	Present
2	Dr. Rahul S. Gohel	Member Secretory	Present
3	Dr. B. B. Radadia	Member from the Department	Present
4	Dr. Y. M. Kadiyani	AC nominated subject expert	Present
5	Dr. Nikesh Kotadiya	AC nominated subject expert	Present
6	Dr. Anvay Upathyay	VC Nominated Subject expert	Present
7	Dr. Manish Vishavadiya	Co-opt member	_____
8	Dr. Neha T. Patel	Member from the department	Present
9	Dr. Manish N. Jani	AC nominated subject expert	Absent

10	**Dr. R. S. Patel**	**AC nominated subject expert**	Absent
11	**Dr. Rutva Dave**	**VC Nomineted**	Present
12	**Dr. B. A. Jadeja**	**Co-opt member**	_____

Enclosure–I

ZOOLOGY

SCHEME OF INSTRUCTION AND EXAMINATIONS

For Students Admitted from A.Y. 2021-2022 & Onwards

DSE for other Programmes

Semester-IV							
Course Code	**Course**	**Hrs. of Instruction/ week**	**Exam Duration (Hours)**	**Maximum Marks**			**Credits**
				CIA	**SEE**	**Total**	
Part-II							
	Zoology – Basics Of Ecology (For B.Sc. Microbiology)	3	3	30	70	100	3
	Zoology – Basics Of Ecology Practical (For B.Sc. Microbiology)	6	3	40	60	100	2

Enclosure –II

Department: Biology Programme: **B.Sc. Microbiology**

Semester – IV		
Course Code	**Course Title**	**Credits**
22UMBDA401	**Zoology– Basics Of Ecology**	3 Credits

Course Description:

The course "**Zoology– Basics Of Ecology**" is specially designed for educating the students about the need to necessity, conservation and protection about ecology and environment and microbial ecology as welfare of human and its future. For enabling the students to understand the roll of ecology in environment, its importance, habitat, interaction, and abiotic component cycle etc. Students can learn the importance of biotic interaction and habitat ecology, its importance and effect on ecology and environment. It enlightens how to maintain and conserve the environment for the future generation. It is also enlightens that what we need to do for our faith, feature and sustainability for the human society and human fate.

Course Purpose:

This course is designed for complete understanding about Ecology, Sustainability of Environment, and human welfare. With this course, the students can understands the needs of Ecology and Environment conservation. The goal of the course is to inspire the knowledge across habitat ecology, community dynamics and its interactions, Biogeochemical cycles and also about microbial ecology. By this course students get the complete awareness regarding the Ecology, Sustainable living and care of Environment and conservation of biodiversity.

Course Outcomes: Upon completion of this course, the learner will be able to

CO No.	**CO Statement**	**Blooms taxonomy Level (K_1 to K_6)**
CO_1	Describe a basic knowledge and understanding on Origin of Life, Structure, functions and types of Ecology. Also describe all about some abiotic factors.	K1 and K2
CO_2	Illustrate complete information about Habitat ecology, Terrestrial and aquatic environment, Atmosphere, Air and gases. It also illustrate how the habitat loss is occurs.	K2 and K3
CO_3	Develop understanding and functioning of population and community for the environment, interaction among community and environment, trance formation of environmental condition.	K2 and K1

CO_4	Observe identification and effects of Biogeochemical cycles and its importance and maintenance.	K1 and K2
CO_5	Illustrate Microbial ecology including soil and Aero-micro flora and its interaction with the biotic components and significance with human society.	K3 and K3

Course Content	**Hours**
Unit -I: Introduction to Ecology	9Hrs
● History, basic concepts and scopes ● Chemical evolution for the Origin of life. ● Biological evolution for the Origin of life. ● Ecosystem – structure, function and types ● Abiotic factors – Water, Light, Temperature	
Unit-II Habitat Ecology	9 Hrs
● Terrestrial Habitat – Soil formation, constituents, types, profile, soil erosion. ● Aquatic Habitat – Types, Stratification and Zonation. ● Atmosphere – Structure and Stratification. ● Air and Gases, Aerosol. ● Habitat loss - Causes and Effects.	
Unit- III Community and interaction	9 Hrs
● Population Dynemics – Size, Frequency, Density, Abundance. ● Population Natality, Mortality, Dispersion and Age structure. ● Community - Composition, Structure, Quantitative characters, Qualitative characters. ● Interaction – Mutualism, Commensalism, Antagonism, competition. ● Succession – Introduction, General process, Cause, types, Hydrosere, Lithosere.	
Unit- IV Biogeochemical Cycles	9 Hrs
● Gasses cycle - Carbon cycle ● Effect at high concentration Green House Gases - 1. Nitrogen cycle	

2. Oxygen cycle 3. Hydro cycle ● Sedimentary Cycle - Sulphur cycle. ● Human impact of biogeochemical cycle - Phosphorous cycle.	
Unit-V Microbial Ecology	9 Hrs
● History and development, Major contribution ● Soil as habitat natural habitat, Soil microflora ● Airo microflora and Microb dispersal ● Microbiomics reference to Human. ● Micro Interaction – with Microb, Plant and Animal.	

Text Books:

- Arumugam, Concepts of Ecology, seventh edition, 2010, Saras publication.
- Verma, P. S., & Agarwal, V. K. (2015). Environmental Biology: Principles of Ecology., S. Chand publication, New Delhi.

Reference Books:

- Odum, E. P., & Barrett, G. W. (1971). Fundamentals of ecology. Philadelphia: Saunders.
- Groom, M. J., Meffe, G. K., & Carroll, C. R. (2006). Principles of conservation biology, Sunderland: Sinauer Associates publishing.

Zoology – Practical

Semester – IV			
Course Code	**Course Title**	**Hrs/Week**	**Credits**
22UMBDA402	**Zoology– Basics Of Ecology Practicals**	6 Hrs/Week	2 Credits

Course Description:

The practical course is framed to give sound knowledge with understanding of "Zoolog – Basics Of Ecology". This course is specially designed for enable the students to understand the roll of ecology in environment, its importance, future necessity and control of pollution by practical works. It enlightens how each group of organisms are interact and include themselves in the environment with their special characteristics and how they maintain the ecosystem. it also give understanding regarding their Ecological adaptations. It also deals with the Community dynamics and Bio-statistics, too. Practical work of this course also give perfection regarding to the Titration method.

Course Purpose:

This course practical work is in the laboratory to study through performing work, Field work, Specimens, Multimedia, Generating statistical data, Titration method etc. They gain introductory experience in appalling each of the following skills and gain greater proficiency in the selection of them depending on their practicals.

- To develop understanding on the Aquatic ecosystem.
- Understand basics of Chemical Characters of Soil.
- Develop understanding on Animal interaction and Ecological Adaptations.

- Acquire knowledge of Water properties by Titration method.
- Apply the principals of Community dynamics.
- Develop the skill to understand Stastical-data analysis.

Course Outcomes: Upon completion of this course, the learner will be able to

CO No.	CO Statement	Blooms taxonomy Level (S_1 to S_6)
CO_1	Perform and observe Soil chemical characteristics and understand Aquatic ecosystem.	S3
CO_2	Understand water properties like Clorinity, Carbondioxide content, Hardness, BOD and COD etc. through performance of Estimation or Measurement by Titration method.	S1

CO_3	Observe, Identify and Understand Biotic interaction and ecological adaptations.	S1 & S3
CO_4	Study and perform Population and Community dynemics.	S4 & S6
CO_5	Demonstrate and observe Bio-statistics and habitat ecology.	S2 & S3

Practicals

1. Study of Aquatic ecosystem
    a. Pond ecosystem
    b. Oceanic Zonetion
2. To Compare the chemical characteristics of soil - I
    a. pH
    b. Moisture content
3. To Compare the chemical characteristics of soil - II
    a. Carbonate content
    b. Nitrate content.
4. Estimation of Clorinity in water.
5. Estimation of carbon dioxide in tap water.
6. Measurement of water quality, based on Hardness.
7. Measurement of water quality, based on BOD and COD.

8. Study of Biotic-interaction.
9. Study of Ecological adaptation part I.
10. Study of Ecological adaptation part II.
11. To determine 'species Area curve' and community size by quadrate method.
12. To determine Frequency of the community by quadrate method.
13. To determine Density of the community by quadrate method.
14. To determine Abundance of the community by quadrate method.
15. To determine population strength by quadrate method.
16. To calculate Median for community dynamics.
17. To calculate Mode for community dynamics.
18. To calculate Mean for community dynamics.
19. To determine Water holding capacity of the soil from deferent soil samples.
20. To count planktonic population among polluted water.
21. Study of Marine Habitat and stratification.
22. Habitat study of Desert Area, Forest Area, Fresh water Area.

Reference books

- Verma, P.S., Agrawal, V.K. (2005). Ecology, Cell Biology, Molecular Biology, Genetics. New Delhi: S. Chand and Company Limited.
- Lal S. S., Practical book of Chordate., 2014, Rastogi publication, Meerut .
- Jaysurya, Arumugam A., Zoology Practical, 2015, Saras Publication, South India.

Pedagogic tools:

- Chalk and Board
- Power point presentation
- Seminar
- Videos
- By field visit
- e-learning – Facebook page Royal Botany
- By models, specimens, charts, permanent slides
- By workshop

Methods of Assessment & Tools:

Components of CIE: 30 marks : Theory:

Sr. No.	Component	Content	Duration (if any)	Marks	Sub Total
A	Test 1	1st 2 units	$1^{1/2}$ hours	5 (Set for 30)	20
	Test 2	All 5 units	3 hours	15 (Set for 70)	
B	Assignment			05 (Set for 20)	10
C	Class activity			05 (Set for 20)	
				Grand Total	**30**
Assignment	● Question answer ● Student generated hand book ● Essay writing ● Case study ● Abstract and exclusive study ● Power presentation ● Chart/model ● Poster ● Herbarium preparation				
Class activity	● Quiz ● One minute game on the base of the topic ● Group discussion, ● Student talk, etc…				

Components of CIE: 30 marks : Practical:

Sr. No.	Component	Content	Duration (if any)	Marks	Sub Total
A	Test	60% of Practical course	2 hours	15 (Set for 30)	15
B	Observation books and record	All Practicals	-	05 (Set for 05)	5
				Grand Total	**20**

Department: Biology Programme: **B.Sc. All Programes**

Semester – IV		
Course Code	**Course Title**	**Credits**
22UBIGE01	**PART – II – GENERIC ELECTIVE COURSES** WILD LIFE ECOLOGY	2 Credits

Course Description:

The course "WILD LIFE ECOLOGY" is enable the students to understand the nature and occurrence of wild life and its ecology. The course specially designed for educating the students about importance of Wildlife, its necessity and its interaction with ecology. this course also educating the students about the need to necessity, conservation and protection about ecology and environment and wildlife as welfare of human and its future. For enabling the students to understand the roll of ecology in environment, its importance, habitat, interaction, and abiotic component cycle etc. Students can learn the importance of biotic interaction and habitat ecology, its importance and effect on ecology and environment. It enlightens how to maintain and conserve the environment for the future generation. It is also enlightens that what we need to do for our faith, feature and sustainability for the human society and human fate.

Course Purpose:

This course is designed for complete understanding about Wildlife and its Ecology, Sustainability of Environment, and human welfare. Educating the students about the need to protect and preserve the environment as long range goal for welfare of future generation. With this course, the students can understands the needs of Ecology and Environment conservation and importance of wildlife. The goal of the course is to inspire the knowledge across intertrophic intraction among the biotic factors, adaptations of animals and adaptation approach, study of sanctuaries and National parks. They also learn about wilflife conservationa, conservation Acts. By this course students get the complete awareness regarding the Wilf life and Ecology, Sustainable living and care of Environment and conservation of biodiversity.

Course Outcomes: Upon completion of this course, the learner will be able to

CO No.	**CO Statement**	**Blooms taxonomy Level**

		(K_1 to K_6)
CO_1	Describe a basic knowledge and understanding on Gradients of communityes, Niches, Food webs and intertrophic interaction.	K1 and K2
CO_2	Illustrate complete information about Adaptations, its applied aspects and Natural selection.	K2 and K3
CO_3	Develop understanding and functioning of Sanctuaries.	K2 and K1
CO_4	Observe identification, understanding about National parks.	K1 and K2
CO_5	Illustrate conservation of wildlife, wildlife management, wildlife Acts.	K3 and K3

Course Content	**Hours**
Unit-1: Ecosystem management and conservation	6 Hrs
● Introduction ● Definitions ● Gradients of communities ● Niches ● Food webs and intertrophic interactions	
Unit – 2: Animals as individuals	6 Hrs
● Introduction ● Adaptation ● Examples of adaptation ● Applied aspects ● Natural selection	
Unit – 3: Sanctuaries	6 Hrs
● Khijadiya bird sanctuary ● Kutch desert wild life sanctuary ● Nal-sarovar bird sanctuary ● Barda wild life sanctuary ● Hingolgadh sanctuary	
Unit – 4: National Parks	6 Hrs
● Gir forest national Park ● Marine national park ● Velavadar kadiyar national Park ● Ranthambhor tiger national park	

●	
Unit – 5: Conservation	6 Hrs
● Wild life management ● Wild life Acts ● Wild life conservation ● Control ● Field Visit	

Taxt Books

- E. A. Thomas, Forest management, 3rd edition(2014), Bellington publication.
- Gopal Rajesh, Introduction to Wild life management, 2nd edition,

Reference books

- Anthony R. E,, Wild life ecology, conservation and management, 2nd edition, Black well publicing
- Singh J. S., Singh S. P., Gupta S. R., Ecology, environment and resource conservation, Edition 2nd (2006) Anamaya publication, New Delhi.

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Affiliated to Saurashtra University, Rajkot

10th Meeting of Board of Studies in Botany/ Zoology

Faculty of Science

Department of Biology

Date: 12/11 / 2022 Time: 11 :00 am Venue: Biology Department

BoSMemebers:

Sr. No.	Name	Membership	
1.	Dr. Reena P. Dave	Chairman	
2.	Dr. Rahul S. Gohel	Member Secretory	
3.	Dr. B. B. Radadia	Member from the Department	
4.	Dr. Y. M. Kadiyani	AC nominated subject expert	(Election Duty) online present
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8.	Dr. Neha T. Patel	Member from the department	12/11/2022
9.	Dr. Manish N. Jani	AC nominated subject expert	(Election Duty) online present
10.	Dr. R. S. Patel	AC nominated subject expert	(Examination Duty) online present
11.	Dr. Rutva Dave	VC Nominated	(Examination Duty) online present
12.	Dr. B. A. Jadeja	Co-opt member	