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	Ninth	30- 04-2022

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: 30 / 04 / 2022 Time: 12:30pm Venue: Board Room

MINUTES OF THE MEETING

Agenda & notes

AGENDA

1. Introductory remarks by Chairperson
    - Confirmation of MoM & ATR of previous BoS held on 18/12/2021
    - Departmental activities and updates
2. Syllabi of DSE cluster courses offerd for BSc. Biochemistry / Microbiology Programme Semester III.
3. Question paper pattern for DSE cluster courses for Sem.-3 of all B.Sc. programs
4. List of paper setters and examiners for DSE cluster courses for Sem.-3 of all B.Sc. programs
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	_____
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	_____

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 18/12/2021 was confirmed by esteemed members of the board.
2. The Scheme of Learning & Evaluation– DSE cluster Corses for Semester III of the below stated programmesof the Department were **discussed & framed.**
    - B.Sc. Biochemistry **(Enclosure–I A1)**

- B. Sc. Microbiology (**Enclosure-I A2**)

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

3. The Syllabi for DSE offered to below stated programmes of the Department were **discussed & framed.**
   - Semester III B.Sc. Microbiology **(Enclosure –IIA1)**
   - Semester III B. Sc. Biochemestry **(Enclosure –IIA2)**

Discussions:

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

List of the courses whose title got changed

(1). DSE Zoology – Sustainability and Conservation.

(2) DSE Zoology – Ecology and Wild Life.

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 3rdsemester courses were discussed and finalized as indicated in **(Enclosure – III)**

5. Question paper pattern for 3rdsemester 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. NikeshKotadiya**	**AC nominated subject expert**	Present
6	**Dr. AnvayUpathyay**	**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–IA1

ZOOLOGY

SCHEME OF INSTRUCTION AND EXAMINATIONS

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

DSE for other Programmes

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

Enclosure–IA2

ZOOLOGY

SCHEME OF INSTRUCTION AND EXAMINATIONS

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

DSE for other Programmes

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

Enclosure –IIA1

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

Semester – III		
Course Code	**Course Title**	**Credits**
21UMBIDC101	**DSE-Zoology** **Zoology– Sustainability and Conservation**	3 Credits

Course Description:

The course "**Zoology – Sustainability and Conservation**" is specially designed to understand the sustainability basic concept of Conservation of natural resources. Students can learn the importance of diversity, its importance and effect of biodiversity loss. 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. It also deals with the Agro-biodiversity and food security, too.

Course Purpose:

This course is required for Sustainability of Environment, Biodiversity and human welfare. With this course, the students can understands the needs of Sustainable planning and biodiversity conservation. The goal of the course is to inspire the knowledge across SDGs(Sustainable Development Goals) By this course students get the complete awareness regarding the Sustainable living and care of Environment and diversity.

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 Sustainable management and UN agenda 2030 and also vision 2050 for sustainability.	K1 and K2
CO_2	Illustrate basics of biodiversity conservation, Endemism and Hotspots of biodiversity.	K2 and K3
CO_3	Develop understanding and functioning of Agro-biodiversity, and importance of Food security.	K2 and K1
CO_4	Observe identification and effects of Biodiversity loss, Threats and Indian position about it. They also develop application	K1 and K4

	toward awarness and skill to practice the tourism toward protected areas.	
CO_5	Observe the use of biodiversity and its instrumentation.	K3 and K3

Course Content	**Hours**
Unit -I: Sustainable Management	9Hrs
● Introduction of Sustainable Management. ● Sustainable development and Green Climate Fund. ● Introduction to Corporate Social Responsibility and ISO 14001. ● 2030 Agenda. ● Vision 2050.	
Unit-II Basic concepts of Biodiversity	9 Hrs
● Biodiversity – Definition and Types. ● Biodiversity Hotspots and Endemism. ● Biodiversity and Wetland management. ● Marine Environment and its biodiversity. ● Biodiversity declining and causes.	
Unit- III Sustainability and Food Security	9 Hrs
● Scope and importance of agricultural biodiversity. ● Agro Ecosystems and Natural ecosystems. ● Issues in sustainable agriculture. ● Food Security – Concept and measurement. ● Food Security and sustainability in India	
Unit- IV Biodiversity loss and Conservation	9 Hrs
● Extent of Biodiversity Loss ● Biodiversity Threats ● The Indian Scenario ● Protected Areas.	

• Countering Biodiversity Loss.	
Unit-V Sustainable use of Biodiversity	9 Hrs
• Sustainable use of Biodiversity. • National Instruments Relating to Biodiversity Management. • International Instruments Relating to Biodiversity Management. • Gender and Biodiversity in India • Conservation Measures of Biodiversity.	

Textbook:

- Jain A. K., Textbook of Physiology, Avichal Publishing Company, 6th edition.(for Unit 2 to 5)
- Vander A, Sherman J. and Luciano D. (2014). Vander's Human Physiology: The Mechanism of Body Function. XIII Edition, Mcgraw Hills.(for Unit 2 to 5)
- Jordan E.L. and Verma P.S., Textbook of Chordates, S. Chand Publication, New Delhi.(for Unit 1)

Reference books

- Tortora, G.J. & Grabowski, S. (2006). Principles of Anatomy & Physiology. XI Edition John Wiley & sons.
- Victor P. Eroschenko. (2008). diFiore's Atlas of Histology with Functional correlations. XII Edition.Lippincott W. & Wilkins.

1. Raven, P.H., Johnson, G.B., Losos, J.B., Singer, S.R. (2005). Biology.Tata McGraw Hill, Delhi.
2. Campbell, N.A., Reece J.B., Urry L.A., Cain M.L., Wasserman S.A. Minorsky P.V., Jackson R.B. (2008). Biology, Pearson Benjamin Cummings, USA.8th edition.
3. Agnes Arber (1999). Herbal plants and Drugs.Mangal Deep Publications.

PRACTICALS:

DSE–Zoology Practical
Zoology – Sustainability and Conservation

21UMBIDC102	Zoology Practicals	6 Hrs/Week	2 Credit

Course Description:

The practical course is framed to give sound knowledge with understanding of "Zoolog – Sustainability and Consurvation". This course is specially designe

d to understand the sustainable management and basic concept of Nature's Conservation. Students can learn the amazing diversity among animals, plants and agriculture products. It enlightens how each group of organisms are

beneficial or harmful and how did they establish themselves in the environment with their special characteristics. It also deals with the differences and similarities between organisms on the basis of their morphology and anatomy.

Course Purpose :

This course practical work is in the laboratory to study through specimen, slide, charge and performing work. 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 diversity of non-ch

ordateandChordates.

- Understandbasicsofhumananato

micalcharacteristicsandstructure.

- Developunderstan

- dingonhistologicalstructures.
- Acquireknowledgeoff

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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	Observation, Identification and isolation of microorganism.	S3
CO_2	Know the characters, function and anatomical structure of Agro-biodiversity specially Crop-diversity and Insect diversity and Vertebrate biodiversity.	S1
CO_3	Understand staining and permanent slide preparation techniques.	S1 & S3
CO_4	Study Endocrinology and human health.	S4 & S6
CO_5	Demonstrate various pathogenic animas and human disease.	S2 & S3

Practicals

1. Isolation of micro organism forms various soil samples.
2. Isolation of micro organism forms various water samples.
3. Herbarium preparation for agro diversity.
4. Study of Legumes agro diversity.
5. Study of Cereals agro diversity.
6. Agro diversity study among Bagayati diversity.
7. Study of Insect diversity part I.
8. Study of Insect diversity part II.
9. Pathogenic insects and its effect on the crop.
10. Animal diversity of Invertebrate animals.
11. Animal diversity of lower Chordate.
12. Animal diversity of Higher Chordate.
13. Preparation of permanent slide by Single staining method.
14. Preparation of permanent slide by Double staining method.
15. Study of Agro ecology to compare natural ecosystem.
16. Biochemical test of Adulteration in powder form agro-product.
17. Biochemical test of Adulteration in addible liquids.
18. Group discussion.
19. Case study.
20. Field visit.

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**

_____

Enclosure –I A2

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

Semester – III		
Course Code	**Course Title**	**Credits**
21UBCID301	**DSE - Zoology** **Zoology: Ecology and Wild life**	3 Credits

Course Description:

The course "**Zoology – Ecology and Wild life**" is specially designed to understand the Ecology environment and Nature.Students can learn functions of Abiotic factors, importance of Habitat and its ecology, communication among population and community. It enlightens what is importance of wild life and how living organisms are come in existence and each group of organisms arose.It also deals with agro-biodiversity and its differences with natural ecosystem. This course also emphasis wild species status, the protected areas and wildlife projects.

Course Purpose:

This course is required for life science majors with a focus in fundamentals of ecology and environmental conservation. With this course, the students can understand the needs of sustainability and utilization for the conservation of Biodiversity. The goal of the course is to inspire the knowledge across diverse fields of zoology. By this course, students get the complete awareness regarding the conservation and sustainable use of natural resources, importance of wild lifeand its conservation. Student can also get good practice in hands for self sustain economy.

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 the ecology, ecosystem and its types. It also describe Biological and chemical evolution of life and students can learn about the whole effect of some of Abiotic factors.	K1 and K2
CO_2	Illustrate habitat ecology, Soil as medium, forest habitat and effects of Habitat loss.	K2 and K3

CO_3	Develop understanding and roll of population and community to maintain the environment. Also it give understanding regarding to community interactions.	K2 and K1
CO_4	Observe cyclic functions of some biogeochemical cycles.	K1 and K3
CO_5	Demonstrate application, importance and principals of wild life for sustainability. It also give hands on practice to establish wild life conservation.	K3 and K4

Course Content	**Hours**
Unit -I: Introduction to Ecology	9Hrs
● History, basic concepts and Applications. ● Chemical evolution for the Origin of life. ● Biological evolution for the Origin of life. ● Ecosystem – structure, function and types. ● Abiotic factors – Water, Light and Temperature.	
Unit-II Habitat Ecology	9 Hrs
● Soil formation, Constituents and its types, Soil profile. ● Soil organism in Terrestrial habitat, Soil Erosion. ● Types, Stratification and Zonation in Aquatic habitat. ● Atmosphere – Structure and Stratification, Air and Gases, ● Causes and Effects of Habitat loss	
Unit- III Community and interaction	9 Hrs
● Population Ecology- Introduction, Natality, Mortality, Age structure and Dispersion. ● Population characteristics - Frequency, Density and Abundance. ● Composition, Structure, Quantitative characters, Qualitative characters of Community ● Ecological Interaction – Mutualism, Commensalism, Antagonism, competition ● Ecological Succession - Introduction, General process, Causes and types.	
Unit- IV Biogeochemical Cycles	9 Hrs
● Carbon cycle	

• Nitrogen Cycle • Phosphorous cycle • Sulfur cycle • Oxygen and Water cycle.	
Unit-V Wild Life	9 Hrs
• Introduction to Wild life and its Status. • Protected Areas. • Threatened species and its conservation. • Wild life Projects- Projects tiger, Asian elephant project, Conservation of Rhinos. • Migration and its type.	

Text Books:

1. Jordan E. L &Varma P.S.(2010) Non-chordate Zoology, S.Chand& Co. Ltd. New Delhi, 4th edition.(for unit 1, 2 &5).
2. PowarNagendra S. (2018) Apllied Zoology2nd edition, Adhyayan Publisher and Distributor.
3. Kotpal R. L.Mordern Text Book of Zoology: Invertibrate, Rastogi Publications, Merrut.
4. Rastogi, V. B. (1994) Organic evolution. KedernathRamnath, India.(for unit 4).

References:

1. Barnes, R.S.K., Calow, P., Olive, P.J.W., Golding, D.W. and Spicer, J.I. (2002). The Invertebrates: A New Synthesis, III Edition, Blackwell Science .
2. Walter, H.E. and Sayles, L.P; Biology of Vertebrates, Khosla Publishing House

PRACTICALS:

DSE – Zoology Practical

	DSE - Zoology Practicals Ecology and Wild life	6 Hrs/Week	2 Credit

Course Description: The practical course is framed to give sound knowledge with understanding of "Zoolog – Ecology and Wild life". This course is specially designed to unders

tand the environment, nature and basic concept of Ecology.Students can learn Estimation and Measurements and analisss is of some ecological parameters. It gives complete understanding about Biostatastical calculation of the

data. It enlightens how each group of organisms arose and how did they establish themselves in the environment with their special characteristics. It also deals with the habitat study and community dynamics.

Course Purpose:

This course practical work is in the laboratory to study through specimen, slide, charge and performing work. They gain introductory experience in appalling each of the following skills and gain greater proficiency in the selection of them dependi

ng on their practicals.

- To develop understanding on the ecosystem of s

pecificenvironment.

- Understandwateranalysisan

dwaterqualitymeasurements.

- Develop understandi

ngonBioticinteractionandecologicaladaptation

s.

- Acquire knowledge with practice on Community par

ameters.

- Apply the principal of population string

thandquadratefordefferentEcologicalparameter

s.

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	Demonstrate aquatic ecology and chemical analysis.	S3
CO_2	Practices for water quality Estimation and Measurments.	S1
CO_3	Understand biotic interaction and its importance for ecology.	S1 & S3
CO_4	Learn and study the Biostatistics and data analysis.	S4 & S6
CO_5	Practices and Demonstrate population parameters and habitat study.	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 Chlorinity 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 Ecological (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 calculate Mean for community dynamics.
16. To calculate Median for community dynamics.
17. To calculate Mode for community dynamics.
18. To determine population strength by quadrate method.
19. To determine Water holding capacity of the soil from deferent soil samples.
20. Study of Marine Zonetion and stratification.
21. Habitat study - Desert Area, Forest Area, Fresh water Area

Reference books

- Lal S. S., Practical book of Non-chordate.,.
- 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**
