



HYDERABAD (SIND)
NATIONAL COLLEGIATE BOARD

HSNC Board's

Smt. Chandibai Himathmal Mansukhani College

(Autonomous)

(Affiliated to the University of Mumbai)

University College Code : 217-JD Office : T14



Estd. 1965

Principal : Dr. Manju Lalwani Pathak

Ref No: CHM (A) AC/C/01/2025

Date: 18th June 2025

CIRCULAR

The immediate attention of all concerned is invited to this office Circular No. CHM (A) AC 05/2025 dated 19th May, 2025 regarding the Choice Based and Credit Based Syllabus (CBCS) for all subjects of F.Y.B.Sc. & T.Y.B.Sc. in Zoology SEM - I & SEM - V respectively.

It is hereby communicated that the recommendations of the syllabus made by the Ad-hoc Board of Studies in Zoology coordinated by the Dean, Faculty of Pure Sciences in the meeting of Academic Council held on 23rd May, 2025 vide item No. 5.5, have been accepted and subsequently passed.

In accordance, therewith, the syllabus as per the CBCS has been brought into force with effect from the academic year 2025 - 2026 and accordingly the same is attached for reference and is available on the College's website www.chmcollege.in

Ulhasnagar - 421 003

18th June, 2025

Dr. Manju Lalwani Pathak

Principal & Chairperson, Academic Council

Copy forwarded for information to:-

- 1) The Dean, Faculty of Pure Sciences
- 2) The Chairperson, Ad-hoc Board of Studies.
- 3) The Controller of Examination.
- 4) The Registrar



HSNC Board's

**Smt. Chandibai Himathmal Mansukhani College,
Ulhasnagar
(Autonomous)**

Affiliated to the University of Mumbai

**First Year BSc
(Zoology)
Semester – I**

**With effect from the
Academic Year 2025-2026**

PREAMBLE

The First-Year B.Sc. Zoology program offers an essential and comprehensive foundation in life sciences, introducing students to the integrated study of animal life processes and behavioral sciences. The course thoughtfully covers the key physiological mechanisms such as digestion, respiration, circulation, excretion, and control and coordination in animals, and extends into ethology - the scientific study of animal behavior - along with basic ecological principles and biodiversity studies.

The curriculum is thoughtfully designed to not only impart theoretical knowledge but also instill critical skills such as observation, experimentation, analysis, interpretation, and scientific communication. Recognizing the importance of interdisciplinary connections, the syllabus introduces learners to various applications of zoological sciences in research, conservation, healthcare, and allied industries like aquaculture, apiculture, and animal husbandry.

A major goal of the program is to foster environmental consciousness and a sense of stewardship for biodiversity and ecosystems. Students engage with contemporary issues like climate change, species conservation, and habitat loss, encouraging socially responsible thinking. Through a combination of experiential learning, problem-solving activities, field studies, case studies, and practical work, learners are empowered to transform knowledge into action, fostering academic excellence, employability skills, entrepreneurial abilities, and leadership qualities for the future.

PROGRAMME SPECIFIC OUTCOME (PSOs)

Upon successful completion of Course, students will be able to:

PSO 1. Learners will develop a strong conceptual and practical foundation in animal physiology, behaviour, and adaptive mechanisms through laboratory work, ethological studies, and ecological field visits.

PSO 2. Learners will build essential skills in scientific communication, critical thinking, and research readiness—preparing them for higher education, wildlife studies, veterinary sciences, and environmental careers.

**Smt. Chandibai Himathmal Mansukhani College
(Autonomous)**

**First Year B. Sc.
(Zoology)
(Aided)**

Semester- I

**Vertical -1
Major -4 Credits**

**With effect from the
Academic Year 2025-2026**

Title: Life Processes and Animal Behaviour

Course Code: CHMZOO11

Sr. No.	Heading	Particulars
1	Description of the Course	This course provides an integrated understanding of core physiological processes - such as digestion, respiration, circulation, excretion, reproduction, and hormonal regulation - across animal groups. It also introduces key concepts in animal behaviour, including communication, courtship, social interaction, and adaptive strategies like echolocation and camouflage. With a blend of theory, practicals, and field-based learning, the course builds foundational knowledge and skills relevant to careers in zoology, wildlife studies, and life sciences.
2	Vertical 1	Major
3	Type	Theory + Practicum
4	Credit	2 + 2 = 4 Credits
5	Hours Allotted	30 + 60 Hours
6	Marks Allotted	50 + 50 = 100 Marks
7	Course Objectives - To develop a foundational understanding of essential life processes and physiological systems across animal taxa. - To introduce students to key behavioral adaptations and ethological concepts that explain survival, communication, and social interactions in animals.	
8	Learning Outcomes Upon completion of the course, the learners should be able to: LO 1 Describe and compare the structure and function of major organ systems involved in digestion, respiration, circulation, excretion, and reproduction. LO 2 Identify, interpret, and analyze diverse animal behaviour and adaptive strategies in natural and experimental contexts.	
9	Syllabus UNIT I: Life Processes Comparative Animal Physiology: - Integument, types of integuments and epidermal Derivatives: - Scales (fish) and Glands (amphibians, reptiles and aves) - Nutritional apparatus: - Amoeba, Cockroach, Ruminants, Human - Respiratory apparatus - Earthworm, Fish, Frog, Bird, and Human - Circulation Apparatus - Heart in Cockroach, Frog and Human - Excretory Apparatus - Nephridia, Malpighian tubules and Human kidney - Regulatory Apparatus - Neuron structure, Endocrine glands (Thyroid Gland, Adrenal and Pancreas) Reproduction and Hormonal Regulation: - Reproduction: Overview - Asexual and sexual reproduction basics - Gametogenesis & Fertilization - Spermatogenesis, Oogenesis, external and internal fertilization	

	• Modes of Reproduction - Oviparity, Viviparity, Ovoviviparity • Estrous and menstrual cycles UNIT II: Amazing world of animals and Ethology Wonders of the Wild • Definition, Mechanism, Adaptation and Functions of Echolocation in Owl and Bioluminescence in firefly • Physiological Adaptations in Chameleon (Thermoregulation), Eel (electricity), Octopus (jet propulsion) • Definition, Mechanism, Adaptation and Functions of Camouflage in Indian Nightjar & Regeneration in Sea star • Animal Intelligence - Chimpanzee & Crow & Magnetoreception in Sea turtle navigation • Parental care in Darwin frog and Hornbill Introduction to Ethology • Ethology- Definition and Significance, Tinbergen's contribution • Types of Animal Behavior: Innate vs Learned, Social behavior, Imprinting • Communication in Animals: Bee dance, Dolphin whistles, Chemical cues - Ant trail Pheromones • Mating Behavior and Altruism: Courtship in frogs/birds; Kin selection in ants/bees																											
10	Scheme of Examination and Assessment Pattern (Paper – 50 Marks) A. External Examination: Semester End External - 30 marks Time: 1:00 hour Format of Question Paper Attempt all questions. <table><tr><th>Question No</th><th>Nature of Questions</th><th>Marks</th></tr><tr><td>Q1</td><td>Attempt any two questions out of four (5 marks each) based on Unit-1</td><td>10</td></tr><tr><td>Q2</td><td>Attempt any two questions out of four (5 marks each) based on Unit-2</td><td>10</td></tr><tr><td>Q3</td><td>Attempt any two questions out of four (5 marks each)/Any five out of ten (2 marks each) based on Unit-1 and Unit-2</td><td>10</td></tr><tr><td></td><td>Total</td><td>30</td></tr></table> Note: Equal Weightage is to be given to all the units. B. Internal Examination (20 marks) <table><tr><th></th><th>Assessment / Evaluation</th><th>Marks</th></tr><tr><td>1.</td><td>Evaluation through: Quizzes, Class Tests, Presentation, Project, Role play, Creative writing, Assignment.</td><td>15</td></tr><tr><td>2.</td><td>Overall conduct as a responsible student, manners, attentiveness and inquisitiveness, skill in articulation, leadership qualities demonstrated through organizing co-curricular activities, etc.</td><td>5</td></tr><tr><td></td><td>Total</td><td>20</td></tr></table>	Question No	Nature of Questions	Marks	Q1	Attempt any two questions out of four (5 marks each) based on Unit-1	10	Q2	Attempt any two questions out of four (5 marks each) based on Unit-2	10	Q3	Attempt any two questions out of four (5 marks each)/Any five out of ten (2 marks each) based on Unit-1 and Unit-2	10		Total	30		Assessment / Evaluation	Marks	1.	Evaluation through: Quizzes, Class Tests, Presentation, Project, Role play, Creative writing, Assignment.	15	2.	Overall conduct as a responsible student, manners, attentiveness and inquisitiveness, skill in articulation, leadership qualities demonstrated through organizing co-curricular activities, etc.	5		Total	20
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11	REFERENCE Animal Physiology References 1. Hill, R. W., Wyse, G. A., & Anderson, M. (2016). Animal Physiology: Mechanisms																											

REFERENCE**Animal Physiology References**

1. Hill, R. W., Wyse, G. A., & Anderson, M. (2016). *Animal Physiology: Mechanisms and Adaptations* (4th ed.). Sinauer Associates.
2. Schmidt-Nielsen, K. (1997). *Animal Physiology: Adaptation and Environment* (5th ed.). Cambridge University Press.
3. Moyes, C. D., & Schulte, P. M. (2016). *Principles of Animal Physiology* (3rd ed.). Pearson.
4. Willmer, P., Stone, G., & Johnston, I. (2005). *Environmental Physiology of Animals* (2nd ed.). Blackwell Publishing.
5. Randall, D., Burggren, W., & French, K. (2002). *Eckert Animal Physiology: Mechanisms and Adaptations* (5th ed.). W.H. Freeman.
6. Kardong, K. V. (2018). *Vertebrates: Comparative Anatomy, Function, Evolution* (8th ed.). McGraw-Hill.
7. Silverthorn, D. U. (2018). *Human Physiology: An Integrated Approach* (8th ed.). Pearson.
8. Sunders, W. B. (1975). *Comparative Animal Physiology* (2nd ed.). W.B. Saunders.5

Ethology and Animal Behavior References

9. Alcock, J. (2013). *Animal Behavior: An Evolutionary Approach* (10th ed.). Sinauer Associates.
10. Tinbergen, N. (1963). *The Study of Instinct*. Oxford University Press.4
11. Lorenz, K. (1981). *The Foundations of Ethology*. Springer.
12. Bradbury, J. W., & Vehrencamp, S. L. (2011). *Principles of Animal Communication* (2nd ed.). Sinauer Associates.
13. Dugatkin, L. A. (2020). *Principles of Animal Behavior* (4th ed.). University of Chicago Press.
14. Breed, M. D., & Moore, J. (2021). *Animal Behavior* (3rd ed.). Academic Press.
15. Manning, A., & Dawkins, M. S. (2012). *An Introduction to Animal Behaviour* (6th ed.). Cambridge University Press.

Specialized Topics

16. Nelson, R. J., & Kriegsfeld, L. J. (2017). *An Introduction to Behavioral Endocrinology* (5th ed.). Sinauer Associates.
17. Krebs, J. R., & Davies, N. B. (1993). *An Introduction to Behavioural Ecology* (4th ed.). Wiley-Blackwell.
18. Campbell, N. A., & Reece, J. B. (2017). *Biology* (11th ed.). Pearson. (Covers physiological systems)
19. Pfaff, D. W., & Joëls, M. (Eds.). (2017). *Hormones, Brain, and Behavior* (3rd ed.). Academic Press.
20. Prosser, C. L. (1991). *Comparative Animal Physiology* (4th ed.). Wiley-Liss.

**Smt. Chandibai Himathmal Mansukhani College
(Autonomous)**

**First Year B. Sc.
(Zoology)
(Aided)
Semester- I**

**Vertical -1
Major – Practical- 2 Credits**

**With effect from the
Academic Year 2025-2026**

Title: Practical based on Life Processes and Animal Behaviour
Course Code: CHMZOOI2

Sr. No.	Heading	Particulars
1	Description of the Course	This course provides hands on practical training on laboratory safety practices, standard chemical preparation procedures, microscope handling, and elementary chromatographic and colorimetric techniques. With a blend of theory, practicals, and field-based learning, the course builds foundational knowledge and skills relevant to careers in zoology, life process and life sciences.
2	Vertical 1	Major
3	Type	Practicum
4	Credit	2 Credits
5	Hours Allotted	60 Hours
6	Marks Allotted	50 = 50Marks
13	Course Objectives:	1. To develop technical skills in observing, identifying, and experimentally demonstrating physiological and behavioural processes in animals. 2. To provide hands-on training in laboratory techniques, specimen handling, mounting, dissection, and field-based animal behaviour study.
14	Learning Outcomes	Upon completion of the course, the learners should be able to: LO 1 Describe and compare the structure and function of major organ systems involved in digestion, respiration, circulation, excretion, and reproduction. LO 2 Identify, interpret, and analyze diverse animal behaviour and adaptive strategies in natural and experimental contexts.
15	List of Practical	1. Introduction to Basic Laboratory Safety Practices – Precautions, Rules, and Safety Symbols 2. Study and Handling of the Compound Microscope – Structure, Care, and Functional Components & Focusing of permanent slide under 10X & 45X 3. Temporary Mounting and Observation of Paramecium from Pond Water – Study of Locomotion and Shape 4. Temporary Mounting and Comparative Study of Fish Scales – Placoid, Cycloid, and Ctenoid Types 5. Measurement of Human Lung Capacity – Balloon Method and Observation of Light Reflex 6. Measurement of pH Using Natural Indicators – pH of Milk, Lemon Juice, Aerated Drinks Using Red Cabbage Extract 7. Study and identification of: • Feather Types: Contour, Filopulme, Down and Bristles • Horns Hooves and Nails 8. Study and identification of: • Indian Non- Venomous & Venomous Snakes • First aid for snake bite 9. Study of Animal Architects

	• Nest Construction in Spider & Paper Wasp • Study of brood parasitism in Cuckoo bird 10. Study and identification of: • Imprinting Behavior – Zebra Finch, Duckling and Penguin • Ritualization and Altruism in Animals – Dog, Peacock, Fiddler Crab, Meerkat, and Elephant 11. Study tour - Visit to fish market/ National Parks / Sanctuaries / and such other places to observe invertebrates. College may conduct more than one field visit for wide exposure, if feasible. However, at least one field visit should be such that it is affordable to every student																															
16	Scheme of Examination and Assessment Pattern Paper – 50 Marks A. External Practical Examination: Semester End External-30 marks Time: 2 hrs Format of Question Paper <table> <tr> <td>Q.1</td><td>One Major experiment</td><td>07</td></tr> <tr> <td>Q.2</td><td>One Minor experiment</td><td>05</td></tr> <tr> <td>Q.3</td><td>Identification (any four)</td><td>08</td></tr> <tr> <td>Q.4</td><td>Field Report Submission & Viva</td><td>05</td></tr> <tr> <td>Q.5</td><td>Journal</td><td>05</td></tr> <tr> <td></td><td>Total</td><td>30</td></tr> </table> B. Internal Examination (20 marks) <table> <tr> <td></td><td>Assessment / Evaluation</td><td>Marks</td></tr> <tr> <td>1.</td><td>Evaluation through: Quizzes, Class Tests, Presentation, Project, Role play, Creative writing, Assignment.</td><td>15</td></tr> <tr> <td>2.</td><td>Overall conduct as a responsible student, manners, attentiveness and inquisitiveness, skill in articulation, leadership qualities demonstrated through organizing co-curricular activities, etc.</td><td>5</td></tr> <tr> <td></td><td>Total</td><td>20</td></tr> </table>		Q.1	One Major experiment	07	Q.2	One Minor experiment	05	Q.3	Identification (any four)	08	Q.4	Field Report Submission & Viva	05	Q.5	Journal	05		Total	30		Assessment / Evaluation	Marks	1.	Evaluation through: Quizzes, Class Tests, Presentation, Project, Role play, Creative writing, Assignment.	15	2.	Overall conduct as a responsible student, manners, attentiveness and inquisitiveness, skill in articulation, leadership qualities demonstrated through organizing co-curricular activities, etc.	5		Total	20
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**Smt. Chandibai Himathmal Mansukhani College
(Autonomous)**

**First Year B.Sc.
Semester- I**

**Vertical - 2
Minor –Not applicable**

**With effect from the
Academic Year 2025-2026**

**Smt. Chandibai Himathmal Mansukhani College
(Autonomous)**

**First Year B.Sc.
Semester- I**

**Vertical - 3
Open Elective Course –2 Credits**

**With effect from the
Academic Year 2025-2026**

OPEN ELECTIVES (OE)

For First Year B.Sc.

(Physics, Chemistry, Mathematics, Botany, Zoology, Microbiology)

Students are required to select any one OE subject from the list below

Sr. No.	Subject Name
1.	Communicative English
2.	Performing Arts
3.	Journalism in Hindi
4.	Event Management Course in Sindhi
5.	Basic Tools of AI for Economics and Education
6.	Political Communication and Media Skills
7.	Stress Management - I
8.	Social Media and Communication
9.	Urbanization and Real Estate: Concepts and Contemporary Scenarios
10.	Business of Travel and Tours
11.	Lessons of Reel Making
12.	Basic Accounting
13.	Soft Skills for Corporate Readiness
14.	Business Statistics and SPSS
15.	Beautician : Strategic Business Planning
16.	Current Trends of Fashion Design: Financial Perspective
17.	Digital Marketing
18.	Managing Family Wealth through Family Office
19.	Online Trading in Stock Market



**Smt. Chandibai Himathmal Mansukhani College
(Autonomous)**

**First Year B. Sc.
(Zoology)
Semester- I**

Vertical -4

Vocational Skill Course (VSC)- 2 Credits

**With effect from the
Academic Year 2025-2026**

Title of Paper: Pet Rearing and Care (VSC)
Course Code: CHMZOOI4

S. No.	Heading	Particulars
1	Description of the course	This course provides hands-on knowledge and skills in identifying, managing, and caring for common pet animals such as dogs, cats, and small mammals. It covers aspects of breed recognition, behavior interpretation, grooming techniques, nutrition, first aid, vaccination, and preventive health care. The course also integrates ethical and responsible pet ownership, making learners career-ready for pet-related industries
2	Vertical 4	Vocational Skill Course (VSC)
3	Type	Practicum
4	Credit	2 credits
5	Hours Allotted	60 Hours
6	Marks Allotted	50 Marks
7	Course Objectives: 1. To familiarize learners with the characteristics, behavior, and health management of common pet animals. 2. To develop practical skills in grooming, feeding, basic veterinary care, and understanding pet healthcare needs.	
8	Learning Outcomes: Upon completion of the course, the learners should be able to: LO 1 Identify different breeds of dogs and cats and interpret their behavior through body language. LO 2 Demonstrate competence in pet grooming, first aid, vaccination awareness, and basic health monitoring techniques.	
9	List of Practical 1. Identification of Exotic Dog Breeds Commonly Found in India (Any 5) <i>(German Shepherd, Beagle, Bulldog, Great Dane, Chihuahua, Pug, Labrador, Golden Retriever, Shih Tzu, Siberian Husky)</i> 2. Identification of Indian Dog Breeds (Any 5) <i>(Indian Pariah dog, Rajapalayam, Gaddi, Rampur Hound, Mudhol Hound, Chippiparai, Kanni dog, Himalayan Sheepdog, Kaikadi, Jonangi)</i> 3. Identification of Common Cat Breeds <i>(Persian cats, Bombay cats, Maine Coons, Turkish Van, Siamese cat, Ragdoll)</i> 4. Interpretation of Pet Body Language: Dogs and Cats <i>(Using behavior charts; recognizing stress, fear, aggression, friendliness)</i> 5. Observation of Stages of Estrous Cycle in Female Dogs and Cats through Behavioural and Physical Changes 6. Demonstration of Basic Handling and Restraint Techniques for Dogs & Cats 7. Measurement of Vital Signs in Pets: Temperature, Pulse, and Respiration Rate 8. Study and Demonstration of Grooming Techniques: Brushing, Bathing, Nail Trimming, Ear Cleaning, Hair Trimming, Teeth Brushing 9. Assembly and Demonstration of a Basic Pet First Aid Kit and Management of Emergency Situations (Wound Care, Seizures, Choking, Poisoning) 10. Identification of Common External and Internal Parasites in Pets and Study of Their Treatment and Prevention (Fleas, Ticks, Ear Mites, Sarcoptic Mites, Tapeworm, Giardia, Rabies, Ringworm and Leptospirosis)	

	11. Estimation of Moisture Content in Dry Pet Food Samples 12. Formation of Homemade balanced food. 13. Demonstration of Proper Feeding Techniques for Puppies, Kittens, and Adult Pets 14. Preparation and Study of Vaccination Schedules, Deworming Timelines, and Health Cards for Dogs and Cats 15. Study of Pet Insurance, Adoption Procedures, and Responsible Pet Ownership 16. Visit to an Animal Rescue Centre/Animal Care Centre, Animal Training Centre, Veterinary Hospital, or Pet Grooming Centre and Submission of a Structured Field Report Experiential Assignments • Creation of DIY Pet Toys Using Safe Household Materials • Preparation of Herbal Pet Grooming Products (e.g., Neem-Based Shampoo) • Behavioral Observation Assignment: Recording and Analyzing Pet Behavior over One Week (Students maintain a daily diary on feeding, playing, sleeping patterns of a pet.) • Micro-Project: Designing an Ideal Pet Housing/Enrichment Plan (Dog kennel, Cat climber, Rabbit hutch, Bird aviary.)																			
10	Scheme of Examination and Assessment Pattern Paper – 50 Marks External Examination (Semester end practical assessment) Time: 2 hrs Marks: 30 Marks Format of Practical Question Paper <table border="1"> <tr> <td>Q.1</td><td>One Major experiment</td><td align="center">8</td></tr> <tr> <td>Q.2</td><td>Identification (any five)</td><td align="center">6</td></tr> <tr> <td>Q.3.</td><td>Submissions, Assignments & Projects</td><td align="center">4</td></tr> <tr> <td>Q.4.</td><td>Field Report Submission & Viva</td><td align="center">8</td></tr> <tr> <td>Q.5.</td><td>Journal</td><td align="center">4</td></tr> <tr> <td></td><td>Total</td><td align="center">30</td></tr> </table>		Q.1	One Major experiment	8	Q.2	Identification (any five)	6	Q.3.	Submissions, Assignments & Projects	4	Q.4.	Field Report Submission & Viva	8	Q.5.	Journal	4		Total	30
Q.1	One Major experiment	8																		
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11	REFERENCE Yeates, J. (Ed.). (2019). Companion animal care and welfare: The UFAW companion animal handbook. John Wiley & Sons. ISBN:9781118688793 1. Alderton, D., Edwards, A., Edwards, A., Larkin, P., Stockman, M. The Complete Book of Pets & Petcare: The Essential Family Reference Guide to Pet Breeds and Petcare T Hong Kong: Anness Publishing. 2018. ISBN: 9781844779338. 2. Companion Animals: Their Biology, Care, Health, and Management. Campbell, Karen L., and Campbell, John R.. United Kingdom, Pearson Prentice Hall, 2009. ISBN:9780135047675 3. The Book of Indian Dogs. Baskaran, S. Theodore. Aleph. 2017. ISBN:9789384067571. 4. Encyclopedia of Dogs: A Comprehensive Guide to Dog Breeds. United Kingdom, NPP Books, 2014. ISBN:9780755494958																			

**Smt. Chandibai Himathmal Mansukhani College
(Autonomous)**

**First Year B. Sc.
(Zoology)
Semester- I**

Vertical -4

Skill Enhancement Course (SEC) – 2 credits

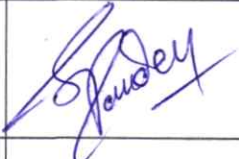
**With effect from the
Academic Year 2025-2026**

Title: Aquarium Management (SEC)
Course Code: CHMZOOI5

S No.	Heading	Particulars
1	Description of the course	This course introduces learners to the fundamentals of setting up, maintaining, and managing freshwater aquariums. It covers aspects such as water quality monitoring, species selection, tank design, feeding regimes, and disease management. The course is designed to impart practical skills and entrepreneurial insights for careers in ornamental fish culture, pet trade, and hobby aquaria.
2	Vertical 4	SEC
3	Type	Practicum
4	Credit	2 credits
5	Hours Allotted	60 Hours
6	Marks Allotted	50 Marks
7	Course Objectives 1. Develop entrepreneurial skill in aquarium management. 2. Enhance professional skill with proper scientific knowledge. 3. Acquaint learners to practical skills of aquarium management.	
8	Learning Outcomes LO 1 Upon completing the syllabus, learners will be able to: LO 2 Work as aquarium maintenance professional. LO 3 Generate source of employment. LO 4 Construct and set aquarium for ornamental fishes. LO 5 Disease management of ornamental fish.	
9	List of Practical 1. Types of aquariums: Freshwater (warm water, cold water), nano, marine, reef tank. 2. Accessories/equipment used in aquarium: Filters (mechanical, biological, chemical), Aerator, Heater, Thermometer, Lights, protein skimmer. 3. Identification of freshwater ornamental fishes: Guppy, Molly (<i>Poecilia</i> spp.), Goldfish (<i>Carassius auratus auratus</i>), Oscars (<i>Astronotus ocellatus</i>), Asian arowana (<i>Scleropages formosus</i>), Siamese fighting fish (<i>Betta splendens</i>), Zebra fish (<i>Danio rerio</i>), Reticulated loach (<i>Botia lohachata</i>), Dwarf gourami (<i>Trichogaster lalius</i>), Denison barb (<i>Sahyadria denisonii</i>), and Rosy Barb (<i>Puntius conchonius</i>) 4. Identification of marine ornamental fishes: Yellowtail damselfish (<i>Chrysiptera parasema</i>), Royal Gramma (<i>Gramma loreto</i>), Powder Blue Tang (<i>Acanthurus leucosternon</i>), Ocellaris Clown Fish (<i>Amphiprion ocellaris</i>), Blue Devil (<i>Paraplesiops meleagris</i>), and Butterfly fish (<i>Chaetodon</i> spp). 5. Study of Aquarium plants: Vallisneria, Hydrilla, Azolla, Pistia, Sagittaria, Amazon Sword, <i>Limnophila</i> , <i>Limnophila aquatica</i> , <i>Ceratophyllum</i> , <i>Chara</i> . 6. Live fish feed: Infusoria, Rotifers, <i>Artemia</i> , Cladocerans, Tubifex worms,	

	9. Basic Pet First Aid: Wound Care, Bandaging, and Emergency Response for Domestic Pets 10. Preparation and Maintenance of Pet Health, Vaccination, and Deworming Records 11. Design and Demonstration of Enrichment Activities and DIY Toys for Pet Mental Stimulation 12. Developing a Pet Care or Pet Accessory Start-up Plan (Grooming Service, Daycare, Pet Bakery, etc.) 13. Case Study Analysis of Common Pet Behavioural Issues and Corrective Measures 14. Visit to a Pet Industry Unit: Grooming Centre / Veterinary Clinic / Pet Product Manufacturing Unit / Pet Boarding Facility																															
10	Scheme of Practical Examination and Assessment Pattern External Practical Examination: Semester End External-50 marks Time: 3 hrs Format of Question Paper <table> <tr> <td>Q.1</td><td>One Major experiment</td><td>8</td></tr> <tr> <td>Q.2</td><td>Identification (any four)</td><td>6</td></tr> <tr> <td>Q.3</td><td>Identification (any two)</td><td>4</td></tr> <tr> <td>Q.4</td><td>Field Report OR assignment</td><td>10</td></tr> <tr> <td>Q.5</td><td>Journal</td><td>02</td></tr> <tr> <td></td><td>Total</td><td>30</td></tr> </table> B. Internal Examination (20 marks) <table> <tr> <th></th><th>Assessment / Evaluation</th><th>Marks</th></tr> <tr> <td>1.</td><td>Evaluation through: Assignment / Case study</td><td>10</td></tr> <tr> <td>2.</td><td>Overall conduct as a responsible student, manners, attentiveness and inquisitiveness, skill in articulation, leadership qualities demonstrated through organizing co-curricular activities, etc.</td><td>10</td></tr> <tr> <td></td><td>Total</td><td>20</td></tr> </table>		Q.1	One Major experiment	8	Q.2	Identification (any four)	6	Q.3	Identification (any two)	4	Q.4	Field Report OR assignment	10	Q.5	Journal	02		Total	30		Assessment / Evaluation	Marks	1.	Evaluation through: Assignment / Case study	10	2.	Overall conduct as a responsible student, manners, attentiveness and inquisitiveness, skill in articulation, leadership qualities demonstrated through organizing co-curricular activities, etc.	10		Total	20
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11	REFERENCE 1. Yeates, J. (Ed.). (2019). Companion animal care and welfare: The UFAW companion animal handbook. John Wiley & Sons. ISBN:9781118688793 2. Alderton, D., Edwards, A., Edwards, A., Larkin, P., Stockman, M. The Complete Book of Pets & Petcare: The Essential Family Reference Guide to Pet Breeds and Petcare T Hong Kong: Anness Publishing. 2018. ISBN: 9781844779338. 3. Companion Animals: Their Biology, Care, Health, and Management. Campbell, Karen L., and Campbell, John R. United Kingdom, Pearson Prentice Hall, 2009. ISBN:9780135047675 4. The Book of Indian Dogs. Baskaran, S. Theodore. Aleph. 2017. ISBN: 9789384067571. 5. Encyclopedia of Dogs: A Comprehensive Guide to Dog Breeds. United Kingdom, NPP Books, 2014. ISBN:9780755494958																															

Department of Zoology:

S. No	Name of the Faculty	Designation and College	Signature
1.	Dr. Shashibhal Pandey	HOD & Associate Professor Smt. CHM College, Ulhasnagar	
2.	Dr. Sandeep Garg	Associate Professor Smt. CHM College, Ulhasnagar	
3.	Dr. Meena Poonja	Assistant Professor Smt. CHM College, Ulhasnagar	

Name & Signature of the Ad Hoc BoS Chairperson: Dr. Shashibhal Pandey



Name & Signature of the Dean: Dr. Neena Anand



**Smt. Chandibai Himathmal Mansukhani College
(Autonomous)**

**First Year B. Sc.
English
(AEC- Ability Enhancement Course)
Semester- I**

**Title: Introduction to Communication Skills in
English**

**Vertical - 5
AEC - 2 Credits**

**with effect from
Academic Year 2025-2026**

Title: Introduction to Communication Skills in English

Course Code: CHMSCIAECI

Sr. No.	Heading	Particulars
1	Description of the Course:	Effective communication is the cornerstone of academic and professional success. This course introduces learners to foundational skills in English communication, with a focus on both oral and written competencies essential in academic, social, and workplace contexts. It aims to equip learners with the ability to read critically, write precisely, speak confidently, and listen actively. Emphasis is placed on building clarity, coherence, and conciseness in communication, along with an understanding of audience, purpose, and tone. The course integrates grammar reinforcement, vocabulary building, reading comprehension, and practice-oriented modules such as email etiquette, group discussion, and formal writing. Through dynamic classroom interactions and practical assessments, learners will gain confidence in using English effectively and purposefully.
2	Vertical 5	AEC- Ability Enhancement Course
3	Type	Theory+ Tutorial (Teaching Methods: Lecture/ Discussion/ Presentation/ Reading sessions/ Worksheets/ Listening to audio clips etc.)
4	Credit	2 Credits
5	Hours allotted	30 Hours
6	Marks allotted	50 Marks
7	Course Objectives: 1. To introduce students to the fundamentals of effective communication and its components. 2. To enhance students' reading comprehension through exposure to multiple genres and contexts. 3. To develop grammatical accuracy and lexical resourcefulness for academic and professional communication. 4. To strengthen verbal and non-verbal presentation skills and promote interactive speaking abilities. 5. To build competence in real-world writing tasks such as email drafting, bio-data preparation, and descriptive writing.	

8	Learning Outcomes: Students will be able to LO-1: Understand and apply key principles of effective communication in varied contexts. LO-2: Comprehend and analyze written texts using appropriate reading strategies. LO-3: Recognize and correct common grammatical and lexical errors. LO-4: Engage in clear, confident, and context-appropriate spoken interactions. LO-5: Produce structured, coherent, and grammatically correct written content for academic and workplace use.
9	Syllabus UNIT I: Foundations of English Communication A) Core Concepts of Communication • Principles of Effective Communication: The 7 Cs • Verbal and Non-verbal Communication with Examples • Cross-cultural Communication in the Globalized World • Technology in Communication: Email, Messaging, Video Conferencing • Listening for Detail and Intent: Barriers to Listening and Strategies B) Reading Comprehension • Understanding the Main Idea and Supporting Details • Interpreting Tone, Purpose, and Bias • Using Context Clues for Vocabulary Building • Reading Visual Texts: Graphs, Charts, and Infographics <i>Sample readings will include excerpts from news articles, reports, editorials, and educational essays (200–250 words).</i> C) Grammar and Vocabulary • Subject-Verb Agreement • Sentence Structures • Punctuation and Capitalization • Commonly Confused Words • Editing and Proofreading Practice <i>A remedial and functional approach will be followed with contextual exercises.</i> UNIT II: Applied Communication Skills A) Speaking and Listening Skills • Introducing Oneself in Academic/Professional Settings • Participating in Group Discussions and Expressing Opinions • Delivering a Short Speech (2–3 minutes) on Familiar Topics • Understanding and Responding to Instructions • Listening Comprehension Practice through Audio/Video Clips

B) Functional Writing Skills

- Formal Email Writing with Subject and Tone Sensitivity
- Descriptive Paragraph Writing (People, Places, Processes)
- Bio-data and Resume Writing
- Drafting Job Applications (Solicited and Unsolicited)
- Writing a Statement of Purpose

10

Scheme of Examination and Assessment Pattern**Paper – 50 Marks****External Examination: Semester End External - 30 marks Time: 1:00 hour****Format of Question Paper**

Question No	Nature of Questions	Marks
Q. 1	Short Notes (2 out of 4) Unit – I (A) – Principles and Types of Communication	10
Q. 2 (A)	Reading Comprehension – Unseen Passage (200–250 words) Unit –I (B)	06
Q. 2 (B)	Grammar – Error Correction, Transformation of Sentences (Unit- I - C)	04
Q. 3	Formal Writing Task (1 out of 2 choices) – Email, Resume, SoP, etc. (Unit – II -B)	10
Total		30

Internal Examination: Continuous Evaluation - 20 marks

	Assessment / evaluation	Marks
1.	Activity-Based Assessment – Presentation or Conversation Skills: Individual or group task based on Unit 2(A). Scheduled and assessed during regular class hours.	05
2.	Participation in One Additional Classroom Activity: Activity may include listening to audio clips, reading aloud, group discussion, summarizing, or vocabulary building.	05
3.	Attendance and Overall Engagement: Attendance as per institutional norms, along with active participation in class discussions and tasks.	05
4.	Short Writing Task (Descriptive Paragraph, Email, or SOP extract): Based on Unit 2(B); to be completed as a classroom assignment or home submission	05
Total		20

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REFERENCES:

1. Adler, Ronald B., et al. *Understanding Human Communication*. 15th ed., Oxford UP, 2021.
2. Bailey, Stephen. *Academic Writing: A Handbook for International Students*. 5th ed., Routledge, 2018.

3. Barrass, Robert. *Students Must Write: A Guide to Better Writing in Coursework and Examinations*. Routledge, 2005.
4. Brown, Gillian, and George Yule. *Teaching the Spoken Language: An Approach Based on the Analysis of Conversational English*. Cambridge UP, 1983.
5. Carnegie, Dale. *The Quick and Easy Way to Effective Speaking*. Pocket Books, 2006.
6. Chaney, Lillian, and Jeanette Martin. *Intercultural Business Communication*. 6th ed., Pearson, 2014.
7. Cullen, Pauline, et al. *English Grammar in Use Supplementary Exercises*. Cambridge UP, 2019.
8. Eastwood, John. *Oxford Guide to English Grammar*. Oxford UP, 2005.
9. Gerson, Sharon J., and Steven M. Gerson. *Technical Communication: Process and Product*. 9th ed., Pearson, 2021.
10. Hewings, Martin. *Advanced Grammar in Use: A Self-study Reference and Practice Book for Advanced Learners of English*. 3rd ed., Cambridge UP, 2013.
11. Jones, Leo. *Functions of English: Communication Practice in English*. Cambridge UP, 1981.
12. Kumar, Sanjay, and Pushp Lata. *Communication Skills*. 2nd ed., Oxford UP, 2018.
13. Lynch, Tony. *Listening in Language Learning*. Longman, 1988.
14. McCarthy, Michael, and Felicity O'Dell. *Academic Vocabulary in Use*. Cambridge UP, 2008.
15. Nordquist, Richard. *The Essentials of English Grammar*. McGraw-Hill Education, 2016.
16. Quirk, Randolph, et al. *A Comprehensive Grammar of the English Language*. Longman, 1985.
17. Seely, John. *The Oxford Guide to Writing and Speaking*. Oxford UP, 2005.
18. Straus, Jane, et al. *The Blue Book of Grammar and Punctuation*. 12th ed., Jossey-Bass, 2021.
19. Wallace, Catherine. *Reading*. Oxford UP, 1992.
20. Zinsser, William. *On Writing Well: The Classic Guide to Writing Nonfiction*. Harper Perennial, 2016.

Department of English:

Sr. No	Name of the Faculty	Designation and College	Signature
1.	Prof. (Dr.) Pratima Das	Head & Professor, Dept. of English, Smt. CHM College	<i>Pratima Das</i>
2.	Prof. (Dr.) Kailas Aute	Professor, Dept. of English, Smt. CHM College	<i>Kailas Aute</i>
3.	Mr. Ananda Pandhare	Asst. Professor, Dept. of English, Smt. CHM College	<i>Ananda Pandhare</i>
4.	Ms. Sana Karale	Asst. Professor, Dept. of English, Smt. CHM College	<i>Sana Karale</i>

Name & Signature of the Ad hoc BoS Chairperson: Prof. (Dr.) Pratima Das *Pratima Das*

Name & Signature of the Dean: Prof. (Dr.) Pratima Das *Pratima Das*



**Smt. Chandibai Himathmal Mansukhani College
(Autonomous)**

First Year

Semester- I

Title: Communication Skills in Sindhi

Vertical - 5

Ability Enhancement Course - 2 Credit

**with effect from
Academic Year 2025-2026**

Title: Communication Skills in Sindhi
COURSE CODE: CHMSINAECI

Sr. No.	Heading	Particulars
1	Description the Course:	Sindhi communication skills (B.Com.) Communication is the core component of the commerce and trade. In communication, language plays very significant role. If a student has mastered the skills of language, undoubtedly, he or she would be able to communicate in the best manner. In this course basic part of Sindhi language would be taught based on the NEP 2020. The innovative approach like critical thinking, creative mind, use of technology will lead to communicating and participating with the different groups. The vocabulary section would be given prominence. The course would be in the Devanagari script so that it can attract majority of the students. Even non-Sindhi students shall have opportunity to adopt this course.
2	Vertical 1	AEC – Ability Enhancement Course
3	Type	Theory+ Practicum (Teaching Method: Lecture/ Discussion/Reading)
4	Credit	2 credits (1 credit = 15 hours for theory or 30 hours of Practical work in a semester)
5	Hours allotted	30 Hours
6	Marks allotted	50Marks (50 Marks each)
7	Course Objectives: After successful completion of this course: 1. The learner will get understanding of communication skills. 2. The learner will understand how to accurate the pronunciation of special words in Sindhi 3. The learner will improve the conversation skill in Sindhi. 4. The learner will become best communicator in Sindhi language	
8	Learning Outcomes: Student will be able to LO1: Know the basic special features of Sindhi language. LO2: Understand the skills of communication. LO3: Knowing the conversation with businessmen and customers LO4: Know the etiquettes with parents, relatives, friends and others in effective way	

Unit I – Fundamental of Sindhi Communication

- Introduction of Communication skill through Pictorial Presentation
- Importance of Language
- Basic aspects of language
 - i) Types of Language, ii) Role of Language, iii) Changes in Language
 - iv) Non-violent aspects of language v) Language & New generation
 - vi) Language & Modern Technology
- New Education Policy (NEP) & Importance of language
- Sindhi language: (Special features of spoken Sindhi language with pronunciation through audio visual presentation)

Unit II – Functional Communication

- Importance of Communication
- Types of Communication (Presentation through video clips)
 - i) Verbal, ii) Non-verbal, iii) Written iv) Digital Communication
- Characteristics of Communication
- Obstacles in Communication of Sindhi Language
- Methods of Best Communication through role plays
- Spoken Sindhi in Business
- Conversation with customers and proprietors

यूनिट – 1

- स्मचारी भाषा : वाक्फयत
- भाषा जी अहमियत
- भाषा जा बुनियादी पहल
 - i) किस्म, ii) भाषा जो किरदार, iii) भाषा मे तबदीलियूं iv) भाषा जा अहिसासाती पहलू v) भाषा ऐं नई नसल
- नई तैलीमी नीति ऐं बोलियुन जी अहमियत
- असां जी सिंधी बोली

यूनिट – 2

- राबते जी अहमियत
- राबते जा किस्म
 - i) जिबानी राबतो, ii) गैर जिबानी राबतो, iii) लिखत राबतो iv) डिजीटल राबतो
- राबते मां फायदा
- राबते में रंडकूं
- बेहतर राबते जा तरीका
- ग्राहकन सां सिंधी बोलीअ मे गुप्तगू

10

Scheme of Examination and Assessment Pattern

Paper – 50 Marks

External Examination: Semester End External - 30 marks Time: 1:00 hour

Format of Question Paper

Attempt any 4 out of 6 questions.

Question No	Nature of Questions	Marks
Q1.	Objective Type – Fill in the Blanks / MCQs (Unit I0	15
Q2.	Question on reading skill (Unit II)	07
Q3.	Writing short story from outlines (Unit II)	08
		Total 30

Note:

1. Equal Weightage is to be given to all the modules.
2. Use of non-programmable scientific calculator is allowed in the examination.

Internal Examination: Continuous Evolution - 20 marks

	Assessment / evaluation	Marks
1.	Speaking Activities: (Presentation) Making presentations in the classroom	10
2.	Listening Activities: (Assignment) Listening to speeches, dialogues, announcement and summarizing them	10
	Total	20

11

REFERENCE BOOKS:

1. Sanchari Basha – By Dr. Pushpa Kodwani
2. Sindhi Pahakaa – Dr. Jetly M.K.
3. Sindhi Muhavahra – By Hardwani Lachhman
4. Sindhi Adhyat mak Shabdhkesh – By Hardwani Lachhman
5. Acho Sindhi Sikhu – By Hardwani Lachhman

Syllabus Committee:

Sr No	Name of the Faculty	Designation and College	Signature
1.	Mrs. Kajal Ramchandani	H.O.D. of Jai Hind College	<i>Kajal</i>
2.	Mrs. Komal Totani	Assistant Teacher, Smt. CHM College	<i>Pratima</i>

Name & Signature of the BoS Chairperson: (Mrs. Kajal Ramchandani)_____

Name & Signature of the Dean: (Dr. Pratima Das)_____



**Smt. Chandibai Himathmal Mansukhani College
(Autonomous)**

First Year

Semester- I

**Title: Environmental Management and
Sustainable Development-I**

**Vertical - 5
VEC- 2 Credits**

**with effect from
Academic Year 2025-2026**

Title: Environmental Management and Sustainable Development-I**Course Code: CHMVECI**

Sr. No.	Heading	Particulars
1	Description of the Course:	This course introduces students to the basics of environmental management and sustainable development. It explains how ecosystems work, the importance of biodiversity, and the need to protect our natural resources. Students will learn about different environmental problems, human impact on nature, and how to manage disasters. The course also covers Indian environmental movements, ethics, and the role of public awareness. Real-life examples and case studies help students understand the connection between nature and human communities in a simple and practical way.
2	Vertical 5	VEC
3	Type & Teaching methods	Theory + Practicum Lecture/Discussion/Presentation/Case study,etc
4	Credits	2 Credits
5	Hours allotted	30 Hours
6	Marks allotted	50 Marks
7	Course Objectives: 1. To introduce about ecosystems, biodiversity and to make aware for the need of conservation. 2. To sensitize students towards environmental concerns, issues, and impacts of human population. 3. To analyze the impact of human population growth and development activities on the environment, including issues related to displacement, disaster response, and rehabilitation. 4. To foster awareness of environmental ethics and the role of cultural and social movements in shaping sustainable environmental practices through communication, policy, and activism.	
8	Learning Outcomes: Students will be able to LO1: Explain the interrelationships within ecosystems and analyze energy flow and succession, using examples from various ecological zones. LO2: Critically evaluate biodiversity levels and conservation strategies, applying knowledge of endemic species, threats, and ecological services to real-world scenarios. LO3: Assess the socio-environmental implications of population growth, displacement, and disasters, incorporating case studies to understand sustainable development challenges.	

	LO4: Demonstrate an understanding of environmental ethics and advocacy, by interpreting the influence of cultural values, environmental movements, and communication strategies on sustainability.									
9	Syllabus UNIT I: Ecosystems, Biodiversity and Conservation • Introduction, structure, and function of ecosystems; Energy flow: food chains, food webs and ecological succession. Case studies of the following: a) Forest ecosystem b) Grassland ecosystem c) Desert ecosystem d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) • Levels of biological diversity: genetic, species and ecosystem diversity; Biogeographic zones of India; Biodiversity patterns • India as a mega-biodiversity nation; Endangered and endemic species of India • Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity. • Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value UNIT II: Human Communities and the Environment • Human population growth: Impacts on environment, human health and welfare. • Resettlement and rehabilitation of project affected persons; case studies. • Disaster management: floods, earthquake, cyclones and landslides. • Environmental movements: Chipko, Silent valley, Bishnois of Rajasthan. • Environmental ethics: Role of Indian and other religions and cultures in environmental conservation. • Environmental communication and public awareness, case studies (e.g. CNG vehicles in Delhi).									
10	Assessment Pattern Scheme of Examination and Assessment Pattern Paper – 50 Marks External Examination: Semester End External - 30 marks Time: 1:00 hours Format of Question Paper Attempt any 3 out of 4 questions. <table><tr><th>Question No.</th><th>Nature of Questions</th><th>Marks</th></tr><tr><td>Q.1</td><td>Theory based on Unit I</td><td>10</td></tr><tr><td>Q.2</td><td>Theory based on Unit I</td><td>10</td></tr></table>	Question No.	Nature of Questions	Marks	Q.1	Theory based on Unit I	10	Q.2	Theory based on Unit I	10
Question No.	Nature of Questions	Marks								
Q.1	Theory based on Unit I	10								
Q.2	Theory based on Unit I	10								

Q.3	Theory based on Unit II	10
Q.4	Theory based on Unit II	10
		Total 30

Internal Examination: Continuous Evaluation - 20 marks

	Assessment / evaluation	Marks
1.	Class Test, Creative writing/visits/role play (Short notes/ MCQ's/ Match the Pairs/ Answer in one sentence/ Quiz)	10
2.	Project /Presentation / Viva/Group Discussion/Case study	10
		Total 20

11

REFERENCES :

1. Carson, R. 2002. Silent Spring. Houghton Mifflin Harcourt.
2. Gadgil, M., & Guha, R. 1993. This Fissured Land: An Ecological History of India. Univ. of California Press.
3. Gleeson, B. and Low, N. (eds.) 1999. Global Ethics and Environment, London, Routledge.
4. Gleick, P. H. 1993. Water in Crisis. Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press.
5. Sodhi, N.S., Gibson, L. & Raven, P.H. (eds). 2013. Conservation Biology: Voices from the Tropics. John Wiley & Sons.
6. Thapar, V. 1998. Land of the Tiger: A Natural History of the Indian Subcontinent.
7. Warren, C. E. 1971. Biology and Water Pollution Control. WB Saunders.
8. Wilson, E. O. 2006. The Creation: An appeal to save life on earth. New York: Norton.
9. Harper, Charles L. (2017) Environment and Society, Human Perspectives on Environmental Issues 6th Edition. Routledge.
10. Rajagopalan, R. (2011). Environmental Studies: From Crisis to Cure. India: Oxford University Press.
11. Harris, Frances (2012) Global Environmental Issues, 2nd Edition. Wiley- Blackwell.

Name & Signature of the Dean & Ad-hoc BoS Chairperson (Interdisciplinary):

[Signature]
Dr. Nitin Arekar



**Smt. Chandibai Himathmal Mansukhani College
(Autonomous)**

First Year B.Sc.

Semester- I

**Vertical - 6
CC – Not Applicable**