

Programme Outcomes

After completing the B.Sc. program students will be able to

PO1. acquire knowledge in the field of pure sciences for coherent understanding of the academic field to pursue multi- and inter-disciplinary carriers.

PO2. express thoughts and ideas effectively, communicate with confidence and share views and present the information in concise manner.

PO3. think critically, investigate, plan and execute experimentations independently, achieve scientific, logical and analytical temperament to analyze, interpret the data collected, using various methodologies.

PO4. learn comprehensively to compete with peers, become an excellent team member along with collaborative skills and leadership qualities for larger societal benefits.

PO5. Execute and percolate moral and ethical values in personal, professional and entire community.

PO6. opt for higher studies, research oriented programs competent to implement good laboratory practices,

PO7. use ICT based skills effortlessly in all walks of life and strive towards artificial intelligence.

PO8. indulge in scientific Start-up schemes.

Programme Specific Outcomes

1. To build an interest in botanical science.
2. To create awareness of different fields in botanical sciences
3. To explore the morphological, anatomical details as well as economic importance of algae, fungi, bryophytes, pteridophytes, gymnosperms and angiosperms.
4. To understand physiological processes and adaptations of plants.
5. To provide knowledge about environmental factors and natural resources and their importance in sustainable development.
6. To explain how current medicinal practices are often based on indigenous plant knowledge and to get introduced to different perspectives on treating ailments according to ethno medicinal principles.
7. To be able to apply statistical tools to gain insights into significantly different data from different sources.
8. Students can recall details of the unique ecological and evolutionary features of the local and Indian flora.

Course Outcomes (First Year)

Semester I Paper I

CO1: Gain knowledge about the general characters of division Chlorophyta (i.e. and its economic importance) and to Understand the systematic position, life cycle of *Spirogyra* and *Nostoc*.

CO2: Know economic importance of algae.

CO3: Understand the life cycle of *Rhizopus* and *Aspergillus* and to learn the mode of nutrition in Fungi especially Saprophytism and Parasitism.

CO4: Understand the general characters of Class Hepaticae and the systematic position, structure, life cycle of *Riccia*.

Semester I Paper II

CO1: Understand general structure of plant cell.

CO2: Gain knowledge about ultrastructure, composition and functions of various plant cell organelles such as cell wall, plasma membrane, endoplasmic reticulum and chloroplast.

CO3: Learn about energy pyramids and how energy flows in an ecosystem.

CO4: Acquire knowledge about terrestrial and aquatic ecosystem.

CO5: Have an understanding about phenotype and genotype and to understand mendelian genetic crosses: monohybrid, dihybrid; test cross; back cross ratios.

Semester II Paper I

- a. Understand life cycle , the systematic position and alternation of generations in *Nephrolepis*.
- b. Learn the Stelar evolution in pteridophytes.
- c. Know life cycle, the systematic position and alternation of generations of *Cycas* as well as to know economic importance of Gymnosperm.
- d. Develop critical understanding on morphology of leaf and Inflorescence.
- e. Identify, classify and describe the characteristics of Families Malvaceae and Amaryllidaceae.

Semester II Paper II

- a. Learn about simple and complex plant tissues.
- b. Gain knowledge of primary structure of dicot and monocot root, stem and leaf and to identify types of epidermal hair, monocot and dicot stomata and learn about epidermal tissue system.
- c. Have an understanding of Light reactions, photolysis of water, cyclic and non cyclic photophosphorylation, C3, C4 and CAM pathways involved in the process of photosynthesis.
- d. Get familiar with the concept of primary and secondary metabolites, difference between primary and secondary metabolites.
- e. Know about botanical source, part of the plant used, active constituents present and medicinal uses of plants of grandma's pouch using examples of *Oscimum sanctum*, *Adathoda vasica*, *Zinziber officinale*, *Curcuma longa*, *Santalum album*, *Aloe vera*.

Dombivli Shikshan Prasarak Mandal's

**K.V. Pendharkar College of Arts, Science and Commerce (Autonomous), Dombivli
(East), Dist. Thane**

Department of Zoology

LEARNING OUTCOMES

A. PROGRAMME OUTCOMES (POs)

Name of Programme: B.Sc.

Duration of Programme: 3 Years

PO 1. acquire knowledge in the field of pure sciences for coherent understanding of the academic field to pursue multi- and inter-disciplinary careers.

PO 2. express thoughts and ideas effectively, communicate with confidence and share views and present the information in concise manner.

PO 3. think critically, investigate, plan and execute experimentations independently, achieve scientific, logical and analytical temperament to analyse, interpret the data collected, using various methodologies.

PO 4. learn comprehensively to compete with peers, become an excellent team member along with collaborative skills and leadership qualities for larger societal benefits.

PO 5. execute and percolate moral and ethical values in personal, professional and entire community.

PO 6. opt for higher studies, research oriented programs competent to implement good laboratory practices,

PO 7. use ICT based skills effortlessly in all walks of life and strive towards artificial intelligence.

PO 8. indulge in scientific Start-up schemes.

B. PROGRAMME SPECIFIC OUTCOMES (PSOs)

B.Sc. in ZOOLOGY

After completing B.Sc. in Zoology Programme, students will be able to

PSO 1. introduce themselves with allied branches like Taxonomy, Anatomy, Histology, Aquaculture, Animal Husbandry, Immunology, Hematology, Ecology, Physiology, Environmental Science, etc.

PSO 2. apply the knowledge to solve issues like global warming, shortage of food supply, water crisis, declined ecological productivity, pollution, etc.

PSO 3. check and derive useful content from the reference books related to topic by using critical analysis and framing hypothesis for solution to research problem.

PSO 4. think to bridge the gap between industry and academia.

PSO 5. analyze the roles of animals in the nature and also as renewable resources in the form of living biota.

PSO 6. explore theory and practical knowledge of rearing specialized animals like Honey bees, Silk moth, Lac moth, Goat, Poultry Birds, Pigs, Horses, Cows, Buffalos, Mules etc.

PSO 7. adopt technology and generalize principles of interdisciplinary sciences so as to benefit stakeholder at large.

C. COURSE OUTCOMES

Name of Programme: B.Sc.

Subject: Zoology

Semester I Theory Course I-PUSZOI21-161

Title: Study of Animal World and its Biodiversity.

After completion of the course, student will be able to

CO 1. develop an interest in the fascinating world of animals.

CO 2. appreciate treasure of biodiversity and its importance and hence contribute for its conservation.

CO 3. categorize animals on the basis of fundamental characteristics of each group of vertebrates.

CO 4. realize the ecological and economic importance of vertebrates.

CO 5. use strategies to protect wildlife under Indian Wildlife Protection act, 1972.

CO 6. identify avian fauna with the help of structural and behavioral pattern.

Semester I Theory Course II PUSZOI21-162

Title: Instrumentation and Biotechnology

After completion of the course, student will be able to

CO 1. work safely in the laboratory and avoids the occurrence of accidents

CO 2. choose and operate suitable instruments for the studies they would undertake.

CO 3. apply skills in recombination of useful but rare characters of Kingdom: Animalia

CO 4. think on Gene Therapy and its merits.

CO 5. find accuracy in tabulation and graphical representation of Biological data.

Semester II Theory Course III-PUSZOII21-261

Title: Ecology and Wildlife Management

After completion of the course, student will be able to

CO 1. gain knowledge about nature of animal population and its growth regulating factors.

CO 2. grasp the concept of interrelationship between biotic and abiotic components.

CO 3. inspire to select career options in wildlife studies, research and ecotourism.

CO 4. interpret the values of life tables, sex ratio and survivorship curves of human populations.

CO 5. indicate the location of national parks, sanctuaries and wildlife reserves on maps.

Semester II Theory Course IV-PUSZOII21-262

Title: Nutrition, Public Health and Hygiene, Pollution

After completion of the course, student will be able to

CO 1. inculcate healthy dietary habits.

CO 2. determine his/her BMI and Broca Index.

CO 3. prevent water loss through damaged pipeline.

CO 4. associate with Blood bank, Group of Disaster management etc.

CO 5. find the causes of various types of pollution.

CO 6. demonstrate the First Aid- Techniques

Semester III Theory Course V-PUSZOIII22-361

Title: Fundamentals of Genetics

After completion of the course, student will be able to

CO 1. apply the principles of inheritance

CO 2. interpret the examples of various linkages and crossing over

CO 3. detect and comment on difference in Blood groups and Rh- factor with its significance in blood transfusion.

CO 4. share the knowledge of consanguineous marriages in the context of inheritable changes in progenies

CO 5. detect Barr bodies in human buccal epithelium and find the reason behind it.

CO 6. to depict the genetic code on the basis of mRNA sequence

Semester III Theory Course VI-PUSZOIII22-362

Title: Animal Life Processes

After completion of the course, student will be able to

- CO 1. study comparatively nutritional apparatus, excretory and osmo-regulatory organs in animals.
- CO 2. categorize animals depending on nitrogen compounds they excrete.
- CO 3. introduce cutaneous, branchial and pulmonary respiration in animals.
- CO 4. acquaint with the behavior of continuous and seasonal breeders
- CO 5. detect normal and abnormal urine constituents from the given sample.
- CO 6. know thoroughly the basis of endocrine control and nervous control of body functions.

Semester III Theory Course VII-PUSZOIII22-363

Title: Common Human Diseases and Common drugs, Parasitology, Economic Zoology

After completion of the course, student will be able to

- CO 1. recognize the causes of various stress related problems.
- CO 2. acquire knowledge of causes, symptoms and precautionary measures of infectious diseases.
- CO 3. study human parasites with reference to mode of infection, prevention, life cycle and pathogenicity.
- CO 4. persuade entrepreneurship in Apiculture, Dairy farming, Vermiculture, etc.
- CO 5. detect good quality milk for human consumption.
- CO 6. avoid parasitic infections through awareness campaign.

Semester IV Theory Course VIII-PUSZOIV22-461

Title: Origin and Evolution of Life, Population Genetics, Scientific Research Methodology

After completion of the course, student will be able to

- CO 1. gain insight about origin of life.
- CO 2. explain theories of organic evolution.
- CO 3. differentiate between microevolution and macroevolution.,
- CO 4. collect and analyze data of survey in Mendelian population to draw accurate conclusion.
- CO 5. develop critical thinking on the basis of scientific assumptions
- CO 6. follow ethics in animal research

CO 7. learn to avoid plagiarism in scientific communication.

Semester IV Theory Course IX-PUSZOIV22-462

Title: Cell Biology & Histology and Biomolecules

After completion of the course, student will be able to

CO 1. recollect Cell Doctrine.

CO 2. performs transport mechanisms across the cell membranes.

CO 3. measure the cell size by using stage micrometer.

CO 4. know endomembrane system of cell.

CO 5. explain the role of biomolecules in sustenance of cell life.

CO 6. diagnose the clinical disorders on the basis of symptoms given.

Semester IV Theory Course X-PUSZOIV22-463

Title: Comparative Embryology, Aspects of Human Reproduction, Ethology

After completion of the course, student will be able to

CO 1. recognize the stages of embryonic development.

CO 2. explain types of placentae with their role.

CO 3. find the differences in male and female infertility with their causes.

CO 4. demonstrate instrumental learning in animals.

CO 5. explain social life of insect and ungulates.

CO 6. detect the pregnancy from the given sample of urine using test-kit.

Semester V Theory Course XI-USZO501

Title: Taxonomy- Invertebrates and Type Study

After completion of the course, student will be able to

CO 1. classify Animal Kingdom: Animalia using various criteria.

CO 2. recollect all the rules of Binomial nomenclature.

CO 3. realize the diversity and exceptionality in every group of invertebrate animals.

CO 4. explain phylogenetic relationship of lower organizations of animals.

CO 5. get insight of morphology, anatomy and physiology of representative animal, Sepia.

CO 6. identify various invertebrate animals in the field visit.

Semester V Theory Course XII- USZO502

Title: Haematology and Immunology

After completion of the course, student will be able to

CO 1. comprehend principles of basic hematology, immunology etc.

CO 2. know about the hematopoiesis.

CO 3. diagnose the various clinical conditions in relation to blood

CO 4. describe various aspects of organ transplantation.

CO 5. follow protocol to diagnose AIDS using test ELISA.

CO 6. perform Latex agglutination test, cytometry to take cell count.

CO 7. measure skillfully the concentration of Hb, plasma proteins, lipid etc. from the given samples.

CO 8. compare cells and tissues with their position, structure and functions.

Semester V Theory Course XIII-USZO503

Title: Histology, Toxicology, Pathology and Biostatistics

After completion of the course, student will be able to

CO 1. know the difference between phyto toxins, mycotoxins and zootoxins.

CO 2. estimate LC_{50} , LD_{50} and Sub-lethal dose for experimental work.

CO 3. get familiar with terminology of toxicity, pathology, histology etc.

CO 4. collect, organize and analyze data using parametric test and non- parametric test.

CO 5. elicit types of correlation graphically.

CO 6. prepares tissue wax block to take microscopic sections on microtome machine.

Semester V Theory Course XIV- USZO504

Title: Anatomy and Developmental Biology

After completion of the course, student will be able to

CO 1. tell all the differences between Exoskeleton and Endoskeleton with examples.

CO 2. name all the bones of typical vertebrate animals.

CO 3. describe voluntary and involuntary muscle as a device for movement.

CO 4. recollect names of all the muscles in the body of animals.

CO 5. determine the age of Chick embryo by counting number somite.

Semester V Theory (Applied Component)- USACEENT501

Title: Applied Entomology

After completion of the course, student will be able to

CO 1. classify all the insects up to their orders.

- CO 2. observe and identify the types of larvae and pupae
- CO 3. comment on usefulness and harmfulness of insects.
- CO 4. gain information on insect as soil composer, pollinator, predator and parasite.
- CO 5. focus on business aspects of products of Apiculture, Sericulture and Lac-culture.

Semester VI Theory Course XV- USZO601

Title: Taxonomy- Chordates and Type Study

After completion of the course, student will be able to

- CO 1. explain origin of chordates.
- CO 2. categorize and identify vertebrates on the basis of epidermal derivatives.
- CO 3. justify that all chordates are not vertebrates but all vertebrates are chordates.
- CO 4. disclose viscera of Shark by using virtual technique.
- CO 5. describe various systems of Dogfish, Shark
- CO 6. Draw diagrams of all the systems and girdles of Shark with correct labels

Semester VI Theory Course XVI- USZO602

Title: Physiology and Tissue Culture

After completion of the course, student will be able to

- CO 1. introduces Enzymes as Biocatalyst and diagnostic tool in medicine
- CO 2. explain the concept of Enzyme kinetics and its significance.
- CO 3. derive Michaelis Menten equation based on Michaelis Menten theory.
- CO 4. describe feedback mechanism with endocrine control.
- CO 5. distinguish between exocrine and endocrine glands.
- CO 6. explain hypo and hyper activity of endocrine glands
- CO 7. prepare cells for tissue culture in sterile conditions.

Semester VI Theory Course XVII- USZO603

Title: Genetics and Bioinformatics

After completion of the course, student will be able to

- CO 1. define mutation and differentiate between various mutation types.
- CO 2. demonstrate various techniques in Genetic Engineering.
- CO 3. know about different human genetic disorders.
- CO 4. explain DNA damage and DNA repair

CO 5. elaborate concept of Metabolomics and gives its applications

CO 6. describe biological database tools and its uses

CO 7. use PubMed for downloading research paper from internet with the help of suitable operator.

Semester VI Theory Course XVIII- USZO604

Title: Environmental Biology and Zoopharmacognacy

After completion of the course, student will be able to

CO 1. do water analysis to test water quality.

CO 2. sort out degradable and non-degradable biological waste.

CO 3. think on energy resources and conservation strategies.

CO 4. define Bioprospecting, Zoopharmacognosy and Zoogeography.

CO 5. describe means and barriers of animal distribution.

CO 6. draft report on field visit or long study tour

Semester VI Theory (Applied Component)-USACEENT601

Title: Commercial Entomology

After completion of the course, student will be able to

CO 1. signify the application of IPM – Integrated Pest Management.

CO 2. apply the method of Biological Control of insect pest.

CO 3. appreciate the natural insecticides like Pyrethrins, Azadirachtin and other alkaloids.

CO 4. formulate the doses of insecticides by using probit analysis

CO 5. refers to the subsidized Govt. schemes from agencies like NABARD, KVIC, DIC etc.

CO 6. familiarize with basic concept of accountancy, requirements of Entrepreneurship, sales and marketing strategies as non- commerce candidate.

The End

Programme outcomes (Commerce)

	After completing the programme student will be able	Graduate attribute
PO 1	Demonstrate comprehensive knowledge and understanding of one or more courses relating to Commerce	Disciplinary knowledge
PO 2	Express business or corporate ideas, knowledge, observations and data effectively in writing and oral communication with others using appropriate medium.	Communication skills
PO3	Analyze and evaluate evidence, arguments, claims, and beliefs on the basis of practical applications and supporting scientific data, identify logical flaws and draw conclusions from qualitative and quantitative data.	Critical thinking and scientific reasoning
PO4	Conclude and determine appropriate solutions from possible set of solutions and apply learnings to organizational problems.	Problem solving
PO5	Use the concept of research methodology to execute and report the results of business experiment and market investigation.	Research related skills
PO6	Work in team to gain, generate and disseminate the knowledge of the respective commerce discipline	Cooperation / teamwork
PO7	Make the connection based on prior learnings and experiences and bring these to bear in the context recent trends in commerce.	Reflective thinking
PO8	Find, evaluate and clearly communicate appropriate information through typing and other media on various digital platforms	Information / digital
PO9	Work independently, identify appropriate resources required for a business project and manage to its completion.	Self-directed learning ability
PO10	Acquire learning oriented knowledge and skills that are necessary for participating in activities throughout life to learn, through self-paced and self-directed learning.	lifelong learning
PO11	Map out the task of a team or an organization, and set directions, build a team, motivate, inspire and guide the team members to the right destination in a smooth and efficient way	Leadership readiness/ qualities
PO12	Identify, avoid and fight against unethical behavior and practices in organizational as well as day to day life situations.	Moral and ethical awareness/ analytical reasoning

Programme Specific Outcome:

After completing the three years B.Com. (General) Programme students will be able to:

1. Demonstrate the understanding of various core subjects of B.Com (General) such as Commerce, Accountancy and Business Economics.
2. Apply the subject professional skills such as taxation, capital budgeting, management, entrepreneurial, etc. to real life situations.
3. Carry out market research through formation of hypothesis, analysis and drawing conclusions.
4. Contribute to the society by creating awareness about financial planning, consumers' protection act and practising green marketing, green accounting in their business ventures.

Department of Commerce

Course Name	Course Outcome
Commerce I	After completing the course students will be able to: <ul style="list-style-type: none"> • Describe the fundamentals of business. • Explain the concept of Industry 4.0. • Illustrate the concepts of entrepreneurship. • Apply basic attributes required to start a business. • Assess various problems and promotion of entrepreneurship with special reference to women.
Commerce II	After completing the course students will be able to: <ul style="list-style-type: none"> • Discuss the fundamentals of Service Sector with special emphasis on the retail sector and E-commerce. • Design a market research. • Describe and illustrate the recent trends in service sector. • Identify various career options in banking and insurance sector.
Commerce III	After completing the course students will be able to: <ul style="list-style-type: none"> • Analyze the principles of business management, its scope and significance. • Evaluate the process of business management and its functions. • Describe the characteristics and importance of planning and decision making. • Apply the managerial competencies in the 21st century of business environment. • Apply the fundamentals of delegation of authority and coordination and control.
Commerce IV	After completing the course the learner shall be able to: <ul style="list-style-type: none"> • Evaluate the types of production system. • Describe the structure of Indian financial market. • Identify the products of stock market, commodity market and derivative market. • Compare the various products of investment in the market.
Advertising I	After completing the course the learner shall be able to : <ul style="list-style-type: none"> • Differentiate between the types of advertising. • Analyze role and functions of ad agency. • Examine the economic and social aspects of advertising. • Judge various career opportunities in the field of advertising. • Prepare project on Trends in advertising.
Advertising II	After completing the course students will be able to: <ul style="list-style-type: none"> • Differentiate between traditional media and new age media in advertising. • Design an Ad campaign.

	<ul style="list-style-type: none"> • Create an advertisement and create ad message the appeals the prospective buyers. • Prepare print and broadcast ads. • Apply various techniques of ad evaluation.
Business Law I	<p>After completing the course, the students will be able to:</p> <ul style="list-style-type: none"> • Interpret and analyze the terms and provisions of Indian Contract Act, 1872 and their application. • Describe and evaluate the terms and conditions of Special Contracts • Interpret the provisions of sale of Goods Act, 1930 • Interpret, Analyze and prepare Negotiable Instruments
Business Law II	<p>After completing the course, the students will be able to:</p> <ul style="list-style-type: none"> • Interpret and analyze the terms and provisions of Companies Act, 2013 and their application. • Define the contents of Partnership Agreement and LLP Agreement and describe the provisions of Partnership Act, 1932 and Limited Liability Partnership Act, 2008 • State about Consumer Protection Council and Redressal Agencies, also state about computer related offences • Describe provisions and procedure of registration of Intellectual Property Rights