



K.E.T'S V.G.VAZE COLLEGE OF ARTS, SCIENCE &
COMMERCE (AUTONOMOUS)

Program: BACHELOR OF SCIENCE

Credit Based Semester System
2020–2021

PROGRAM OUTCOMES

Bachelor of Science (B.Sc.) offers theoretical as well as practical knowledge about different subject areas which includes Physics, Chemistry, Mathematics and Biology. This programme course is most beneficial for students who have a strong interest and background in Science and Mathematics. The program outcomes expected from this course can be predicted as follows:

PO.1. This course forms the basis of science and comprises of the subjects like, chemistry, physics, botany, zoology and mathematics.

PO.2. It develops the skill of thinking methodically and helps to draw a logical conclusion.

PO.3. It gives knowledge to contribute to some of today's biggest challenges, like protecting endangered plants animals, developing new ways to treat disease or finding ways to make technology more efficient.

PO.4. The hands-on, practical and flexible approach –a unique feature of Vaze college- along with industry collaboration and expert teaching staff – prepares a student for a career.

PO.5. It helps to develop scientific temper and thus will contribute to the scientific developments. This can add to the progress of the society as well as to the nation.

PO.6.The B.Sc degree in various disciplines of science will provide an opportunity to student to choose their career in various fields such as research in well known institutes like IIT,TIFR,IISC etc

PO.7.The program helps to understand the Biological and Life Sciences, Business, Engineering and Technology, and the Natural Sciences which are considered to be the the key academic fields of study

PO.8. By opting mathematics at degree level, the BSc program prepares students for prominent career in industry, banks, offices and for further academic study.

PO.9.The BSc program in physics helps for the accumulation of facts of nature and the ability to link the facts to observe and discover the laws of nature.It also makes use of computers for simulation studyand appropriate software for numerical computations and statistical analysis of data.It recognises the need for, and have the preparation and ability to engage in independent and life-long learning aimed at improving knowledge skill development in all areas of Physics.

PO.10.TheB.Sc program in zoology help to understand the enormous significance of biodiversity, life processes, and modern taxonomy of animal kingdom. It be correlates the significance of animal kingdom in ecosystem. The program also enables to develop skills to conserve the forest and natural resources .It emphasizes on the importance of endangered species like tiger and promotes the significance to conserve the forest so as to protect food chain in ecosystem.

PO.11.The B.Sc program in Botany maintains a high level of scientific excellence in botanical research with specific emphasis on the role of plants. Create, select and apply appropriate techniques, resources and modern technology in multidisciplinary way.Practice of subject with knowledge to design experiments, analyze and interpret data to reach to an effective conclusion.

Girish Pusalkar

Dr.GirishPusalkar

PROGRAM SPECIFIC OUTCOMES FOR BACHELOR OF SCIENCE(B.Sc)

I) DEPARTMENT OF BOTANY

PSO.1: The student graduating with the Degree B.Sc (Honours) Botany should be able to acquire • Core competency: Students will acquire core competency in the subject Botany, and in allied subject areas. The student will be able to identify major groups of plants and compare the characteristics of lower (e.g. algae and fungi) and higher (angiosperms and gymnosperms) plants.

PSO.2: Students will be able to use the evidence based comparative botany approach to explain the evolution of organism and understand the genetic diversity on the earth.

PSO.3: The students will be able to explain various plant processes and functions, metabolism, concepts of gene, genome and how organism's function is influenced at the cell, tissue and organ level.

PSO.4: Students will be able to understand adaptation, development and behaviour of different forms of life. • The understanding of networked life on earth and tracing the energy pyramids through nutrient flow is expected from the students.

PSO.5: Students will be able to demonstrate the experimental techniques and methods of their area of specialization in Botany. • Analytical ability: The students will be able to demonstrate the knowledge in understanding research and addressing practical problems. • Application of various scientific methods to address different questions by formulating the hypothesis, data collection and critically analyze the data to decipher the degree to which their scientific work supports their hypothesis.

PSO.6: Critical Thinking and problem solving ability: An increased understanding of fundamental concepts and their applications of scientific principles is expected at the end of this course. Students will become critical thinker and acquire problem solving capabilities.

PSO.7: Digitally equipped: Students will acquire digital skills and integrate the fundamental concepts with modern tools.

II) DEPARTMENT OF CHEMISTRY

The B.Sc in Chemistry course of Chemistry Department of V.G.Vaze College will benefit the students in the following way:

PSO.1. Students will have a firm foundation in the fundamentals and application of current chemical and scientific theories including those in branches of Physical, Inorganic, Organic and Analytical Chemistry

PSO.2. It will impart various skills of handling chemicals, reagents, apparatus, instruments and the care and safety aspects involved in such handling.

PSO.3. It will help the learner capable of analysing and interpreting results of the experiments which he/she conducts or performs.

PSO.4. The course is designed in such a way that it will correlate the theoretical aspects learnt in classroom with its practical program.

PSO.5. It will assess the importance of environmental protection by applying the principles of green chemistry.

PSO.6. Students will be able to explore new areas of research in both chemistry and allied fields of science and technology.

PSO.7. The learner will be capable of acquiring or pursuing a source of livelihood like jobs in chemical industry.

PSO.8. The course will make the learner capable of solving problems in the various units of the syllabus

PSO.9. The learner will be able to clearly communicate the results of scientific work in oral, written and electronic formats to both scientists and the public at large.

PSO.10. The use of softwares in chemistry like chemdraw, modern chemical tools, Models, Charts, Equipments etc will enhance the knowledge of the learner

III) DEPRATMENT OF MATHEMATICS

Upon Completion of B.Sc. (Honours) in Mathematics, Students will able to:

PSO.1. Demonstrate basic mathematical skills in various branches of Mathematics like algebra, analysis, geometry, calculus.

PSO.2. Understand the basic rules of logic, including the role of axioms or assumptions in proficiently constructing proofs of important mathematical theorems.

PSO.3. Interpret mathematical and statistical models such as formulas, functions, graphs, tables, and schematics, drawing conclusions and making inferences base on those models.

PSO.4. Use the concepts of analysis in solving problems. The concepts include sets, numbers, functions and convergence.

PSO.5. Appreciate the role of mathematical proof in formal deductive reasoning.

PSO.6. Investigate and apply mathematical problems and solutions in a variety of contexts related to science, technology, business and industry, and illustrate these solutions using symbolic, numeric, or graphical methods.

PSO.7. Develop the ability to think critically, reason and research.

PSO.8. Demonstrate the ability to apply analytical and theoretical skills to model and solve mathematical problems.

PSO.9. Formulate mathematical models of real-life models and suggest possible solutions.

PSO.10. Recognize connections between different branches of mathematics.

PSO.11. Recognize and appreciate the connections of mathematics with other branches of science.

PSO.12. Demonstrate the ability to effectively utilize a variety of ICT enabled teaching techniques and classroom strategies to positively influence student learning.

PSO.13. Present mathematical ideas with clarity and coherence, both verbally and written.

PSO.14. Develop Programming skills to solve problems using JAVA, PYTHON and Sage Math.

IV) DEPARTMENT OF PHYSICS

On completing the **Bachelor's Degree in Science in Physics**, students will be able to :

- **PSO.1** Acquire comprehensive knowledge, logical thinking and have deep understanding of concepts in various fields of science.
- **PSO.2.** Design and execute experiments on various advanced equipment, analyze the results and draw valid conclusions
- **PSO.3.** Demonstrate the use of physical, mathematical, computational techniques and computer software productively in the analysis and solving of complex physical problems
- **PSO.4.** Improve aptitude skill, MOOC learning, do internship and field projects which enable them for better career opportunities by qualifying various state and national level examinations

V) DEPARTMENT OF ZOOLOGY

On completing the **Bachelor's Degree in Science in Zoology**, students will be able to:

- **PSO.1.** Identify, classify different fauna according to the Taxonomical key and advanced tools in Classical Zoology, understand their function of various organ system and thus, can correlate its peculiar characteristics with origin, adaptations and modifications.
- **PSO.2.** Apply the knowledge perceived from practical and theoretic knowledge from Diverse fields of Zoology towards research-oriented studies and develop the qualities such as critical thinking and analysis and the skills of scientific communication along with the ethical aspects of research, covering the dissemination of data and applications of research.
- **PSO.3.** Develop the skills of critical and analytical thinking to focus on the advanced tools of Zoology, handling of scientific instruments and its application in the industry and various sectors, promote self-paced and self-directed learning for personality development.
- **PSO.4.** Implement the work independently to enhance their expertise through various activities like seminars, workshops, assignments, etc., manage a project-based learning on application-oriented ideas in various branches of Zoology to focus on innovative aspects of intellectual learning.
- **PSO.5.** Integrate and analyse knowledge pertaining to access comparative study of various systems across levels of organization ranging from primitive to advanced examples within the zoological sciences to formulate hypothesis and evaluate its scientific findings.
- **PSO.6.** Aware of the norms and conditions, ethics interrelated with the diversity of the flora and fauna, the conservation of valuable resources of the country, responsive to the activities correlated with ecosystem, biodiversity and animal study, create awareness to protect the flora and fauna and build an enriched biodiversity.
- **PSO.7.** Acquire skills in diagnostic testing, haematology, histopathology, molecular biology used in clinical and research laboratories will provide them opportunity to work in diagnostic or research laboratory.
- **PSO.8.** Enhance the application of relevant biological software to analyse the data by obtaining knowledge in biostatistics, computational biology, Molecular biology and Biotechnology.
- **PSO.9.** Apply their knowledge of biological sciences in various disciplines like aquaculture, apiculture, agriculture and medicine, contribute the knowledge for the recent advances in Zoology, promote integrated learning for exploring career opportunities and thus, emphasizing in field-based, application-oriented and research inculcated study.

VI) DEPARTMENT OF BIOTECHNOLOGY

The program outcome of Biotechnology is to produce competent Biotechnologists who can employ and implement their knowledge in premium processes and applications which will profoundly influence existing sectors of agriculture, industry, healthcare and restoration of degraded environment to provide sustainable competitive edge to present society.

PSO.1. The curriculum encompasses various interdisciplinary topics like Basic and Applied Chemistry, Cell Biology, Biodiversity, Biochemistry, Immunology, Biochemistry, Biostatistics, Bioinformatics, Microbiology, Molecular Biology, Genetics, Molecular Diagnostics, Tissue Culture, Scientific Writing and Communication Skills, Entrepreneurship, Pharmacology and toxicology, Bioethics, Biosafety and IPR

PSO.2. Students will be able design, conduct experiments, analyze and interpret data for investigating problems in Biotechnology and allied fields.

PSO.3. Students will exhibit contemporary knowledge in Biotechnology and will be eligible for doing jobs in various sectors of pharmaceutical and biotechnological industry:

PSO.4. Higher studies (Ph.D) can be pursued in order to attain research positions. Various examinations such as CSIR-NET, ARS- NET GATE, ICMR, DBT and many other opens channels for promising career in research.

PSO.5. Students can be employed in pharmaceutical Companies, biofertilizer industry, aquaculture industries, environmental units, crop production units, food processing industries, national bio-resource development firms, KPO.

PSO.6. Entrepreneurship ventures such as consultancy and training centres can be opened.

PSO.7. Industries also employ bio-technological professionals in their marketing divisions to boost-up business in sectors where their products would be required.

PSO.8. Beside industrial sector there are ample opportunities in academics as well.

PSO.9. Students will be able to understand the potentials, and impact of biotechnological innovations on environment and their implementation for finding sustainable solution to issues pertaining to environment, health sector, agriculture, etc.

VII)DEPARTMENT OF INFORMATION TECHNOLOGY

After successful completion of three year degree program in Information Technology a student should be able to

PSO.1.Demonstrate understanding of the principles and working of the hardware and software aspects of computer systems.

PSO.2.Design, implements, test, and evaluate a computer system, component, or algorithm to meet desired needs and to solve a computational problem.

PSO.3.Identify information technology related problems, analyze them and design the system or provide the solution for the problem.

PSO.4.Apply current technical concepts and practices in the core information technologies of human computer interaction, information management, programming, networking, and web systems and technologies.

PSO.5. Enhance skills and adapt new computing technologies for attaining professional excellence and carrying research

PSO.6.Understand, analyze and develop computer programs in the areas related to algorithms, system software, multimedia, web design, big data analytics and networking for efficient design of computer-based systems of varying complexity.

PSO.7.Apply standard Software Engineering practices and strategies in software project development using open-source programming environment to deliver a quality product for business success.

PSO.8.Be acquainted with the contemporary issues, latest trends in technological development and thereby innovate new ideas and solutions to existing problems.

Girish Pusalkar

Dr. Girish Pusalkar
(Dean of Science)