



Jaywant Pratishthan Humgaon, Sanchalit

## Amdar Shashikant Shinde Mahavidyalay, Medha

### Programme outcome for B.Sc. Programme

#### Three-year B.Sc. Programme:

The Three-year B.Sc Programme at Amdar Shashikant Shinde Mahavidyalay, Medha offers courses at First, Second and Third year level in the subjects of Physics, Chemistry, Mathematics, Zoology, Botany, Statistics and Microbiology. All of these subjects are designed with a specific aim of introducing students to various laboratory methods thereby exposing them to several laboratory techniques in handling of state of the art equipment, critical thinking and being independent as well as team learning. They develop laboratory skills throughout the curriculum via hands-on experiences with diverse experimental techniques and tools. They learn several approaches to data analysis and become confident in using computational methods to analyze and solve various problems. Although the student's long term goals are quite varied, these courses help in drawing many to careers that demand scientific and technical knowhow and strong logical reasoning abilities. The following is a specification of the key Programme Outcomes (knowledge, skills, values and attitude) that highlight important areas in which the students are expected to gain proficiency at the end of the tenure of their undergraduate program.

**(1) PO-1: Knowledge:** Learners are encouraged to apply the knowledge of mathematics and science fundamentals to various solutions of complex problems. As such, knowledge of the subject is the sole objective of any student learner. A student is exposed to a wide range of topics in various subjects and is given intensive training in each of the courses that have laboratory related work. The learner is encouraged to use various mathematical methods (analytical and numerical) and experimental methods as an application to the acquired concepts and principles that help in studying various branches of sciences. At the end of the program, students are able to gain thorough knowledge in key areas in the subjects offered.

**(2) PO-2: Problem Analyses:** Well equipped with an understanding of the analytical methods involved, they are in a position to interpret and analyze results so obtained from experiments and draw suitable conclusions against their supported data acquired. At the end of the program, students will be able to identify, formulate and analyze scientific problems and reach concrete solutions using various principles of mathematics and sciences.

**(3) PO-3: Designing Solutions:** Having acquired knowledge of subjects, students are trained to think out of the box, design and conduct an experiment or a series of experiments that demonstrate their understanding of the methods and processes involved. For example, as a part of the project of the final year, students in the subject of Physics are encouraged to calculate the overall power consumption of the institution and think of ways and means of

minimizing this consumption through alternate sources of energy. This in turn helps in the learner; develop a holistic approach from real time solutions. As such, at the end of the program, learners will be able to design solutions for complex problems and design a process/processes that can meet specific needs. (Attainment of this is through projects at the final year level).

**(4) PO-4: Modern tool usage:** As an outcome of PO-1, PO-2 and PO-3, learners are trained to create, select, and apply appropriate techniques, resources and IT tools in the analysis and synthesis of data within limitations. (Outcome of final year project).

**(5) PO-5: Communication Development:** The medium of instruction being English, proficiency in the subject through English is one of the primary objectives of the science program. In order to improve the writing and oral skills of learners, the program caters to ensuring that learners become effective, clear communicators in written and oral work and are capable of explaining complex issues in accessible terms. With English language being the common mode of communication worldwide, all learners under the programme are encouraged to participate in courses designed to equip students with English-language proficiency through Grammar, Written and Spoken English to enable a holistic enhancement of communication. Through a selection of courses such as ability enhancement courses, learners are also trained to communicate efficiently in the languages of Hindi and Marathi. As such, at the end of the program, learners will be capable of oral and written communication, and will prove that they can think critically and work independently. Learners will be able to communicate effectively on scientific issues with the scientific community and society at large in writing effective reports and designing documentation, make effective presentations and give and receive instructions.

**(6) PO-6: Employability:** With our learners long-term professional pursuits being quite varied, many are drawn to careers that require scientific skills or technical expertise or strong quantitative reasoning abilities. Keeping this in mind, the institution apprises students of various employment opportunities that are available in areas of their choice through the Placement cell. To equip these learners with knowledge other than that of the subject such as skills required helping them qualify for jobs, all the science subjects offer skill enhancement courses and value added courses so that learners have a better edge over their counterparts. As such, at the end of the programme students will be able to increase their employability through subject knowledge and additional skills.

**(7) PO-7: Ethics:** While it is necessary to instil the spirit of competitiveness among students in a world of increasing competition, it is equally vital to develop a strong sense of ethics among learners that will help them develop some positive attitudes and values. This includes appreciation of the various principles and theories that evolved in science, the impact that science has on social, economical and environmental issues. One of the main objectives of any academic exercise, therefore, should be to produce well-groomed individuals who



understand the significance of ethical values and abide by them even in the most pressing circumstances. In this programme, this process is enabled through courses and facilitators who integrate the teaching of ethics in everyday pedagogy. As such, at the end of this programme students will be able to develop, internalise and exercise ethics in their professional as well as personal practices.

**(8) PO-8: Environment and Sustainability:** ‘Environmental sustainability’ has become the watchword of the 21st century. An increased engagement with environment-related concerns is appearing tangibly on global fronts; academics cannot and *should not* remain quarantined from this massive development. Through classroom-discussions and research projects, this programme facilitates active dialogues with factors which influence human-ecology interactions. As such, at the end of this programme students will be able to identify and analyze socio-political, cultural and economic problems which act as deterrents to environmental sustainability and provide creative solutions towards the same.

**(9) PO-9: Soft-Skill Development:** Apart from the attainment of knowledge and hands-on skills in practical applicability of the subject, learners need to be equipped with soft-skills and values which will help them function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary groups. These soft-skills include leadership, teamwork, project-management, positive outlook, innovative approaches and effective articulation. Several soft skill programs are organized for learners through various agencies that tie up with the state government. As such, at the end of this programme, students will be able to hone the soft-skills required in positively enhancing their academic, professional and personal pursuits towards self and societal advancement.

**(10) PO-10: Science and Society:** As an outcome of PO-1, PO-2 and PO-3, learners are encouraged to apply logical reasoning based on the knowledge, skills, designing solutions to assess societal, health, safety issues and the responsibilities that go along with the scientific practice. As an extension activity to society, learners are encouraged to take up specific projects such as impact of salinity on fresh water wells in an adopted village, and provide effective solutions.

**(11) PO-11: Life-long learning:** With the pursuit of knowledge for either personal or professional reasons, learners are also encouraged to volunteer and be self-motivated that not only enhances society values, active participation and personality development, but also enhances self-sustainability, competitiveness and employability. As such, learners will be able to recognize the need for, and have the preparation and ability to engage in independent and life-long learning in every broad context of technological changes.



**Amdar Shashikant Shinde Mahavidyalay, Medha**  
**Department of Botany**  
**Programme Specific Outcome and Course Outcome**  
**on CBCS syllabus of Botany**

**Programme Specific Outcome**

Sr. No.	Programme Specific Outcome
PSO 1	Acquisition of knowledge of molecular biology, biotechnology and bioinformatics
PSO 2	Acquiring the basic procedure in the field of microbiology and plant pathology.
PSO 3	Awareness of natural resources and environment
PSO 4	Aptitude for scientific work & ability to pursue studies far beyond graduation
PSO 5	Life science as a career, which is the need now-a-day
PSO 6	Applications of scientific principles for organization of scientific exhibitions and competitions
PSO 7	Development of presentation skills and confidence in students
PSO 8	Skills based practicals and experiments & development of skill of handling of instruments and practical material
PSO 9	Enhancement the interests in the subject
PSO 10	Enhancement of scientific attitude, temper & hobbies
PSO 11	Abilities to apply scientific methods, collection of scientific data, problem solving methodology, Research Paper & project writing, etc
PSO 12	Contribution in scientific method & scientific programs

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**Department of Chemistry**  
**Programme Specific Outcome**

Sr. No.	Programme Specific Outcome
PSO 1	Promote understanding of basic facts & concepts in chemistry while retaining the excitement of chemistry.
PSO 2	Make students capable of studying chemistry in academic & industrial courses.
PSO 3	Expose the students to various emerging new areas of chemistry & apprise them with their prevalent in their future studies & their applications in various spheres of chemical sciences.
PSO 4	Develop problem solving skills in students.
PSO 5	Develop ability & to acquire the knowledge of terms, facts, concepts, processes techniques & principles of subjects.
PSO 6	Expose & develop interest in the field of chemistry.
PSO 7	Develop proper aptitude towards the subjects.
PSO 8	Skills in chemistry practical work, experiments, laboratory materials & proper handling of instruments
PSO 09	Enhancement of scientific attitude & scientific hobbies
PSO 10	Abilities to apply scientific methods, collection of scientific data, problem solving, Research Paper Writing, etc
PSO 11	Appreciation of the subject, contributions of scientists, scientific methods, scientific programs, etc

  
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**Programme Specific Outcomes (PSO)**  
**Department of Mathematics**

Name of Subject	Class	Outcome
Mathematics	First Year	<ul style="list-style-type: none"><li>• Students will acquire basic domain knowledge of different subjects such as Differential calculus, Calculus, Differential Equations</li><li>• Students will be able to apply the concepts in solving the problems such as extreme values, electric circuit problems, and orthogonal trajectories.</li><li>• Students will be able to identify and solve ordinary and partial differential equations.</li></ul>
Mathematics	Second Year	<ul style="list-style-type: none"><li>• Students will be to understand the concepts of Real Analysis and Algebra.</li><li>• Student is equipped with mathematical analysis ability, problem solving skills, creative talent necessary for various kinds of employment.</li><li>• Students will be able to acquire basic Practical skills and exposure to computer programming through practical courses like SCILAB.</li></ul>
Mathematics	Third Year	<ul style="list-style-type: none"><li>• Students will possess subject knowledge required for higher studies, professional and applied courses like M. Sc., Computer studies, Management Studies.</li><li>• Introduction to various courses like group theory, ring theory, field theory, metric spaces, operation research.</li><li>• Students will be able to acquire programming skills through C++ programming.</li><li>• Students will become employable; they will be eligible for career opportunities in Industry, academia.</li></ul>

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**Dept. of Microbiology**

**Program Specific Outcome**

<b>SR.NO.</b>	<b>Program Specific Outcome</b>
<b>PSO 1</b>	Study the microorganisms with regard to morphology, cultural and biochemical characteristics. It will help to classify the microbes to certain extent.
<b>PSO 2</b>	Understand microorganisms and their relationship with the environment and follow the aseptic techniques and conduct the process of sterilization as well as perform the techniques to control the microorganisms.
<b>PSO 3</b>	Conduct the basic research with these microorganisms and perform the diagnostic procedures required in food, milk and pharmaceutical industry.
<b>PSO 4</b>	Acquire knowledge and understanding the concepts of Microbial genetics, Molecular biology, Immunology, Biochemistry, Applied and Environmental Microbiology and Enzymology.

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**Department of Physics**

**Programme Specific Outcomes**

<b>Sr. No.</b>	<b>Programme Specific Outcomes</b>
<b>PSO1</b>	Demonstrate, solve and an understanding of major concepts in all disciplines of physics.
<b>POS2</b>	Solve the problem and also think methodically, independently and draw a logical conclusion.
<b>PSO3</b>	Employ critical thinking and the scientific knowledge to design, carry out, record and analyze the results of Physics experiments.
<b>POS4</b>	Create an awareness of the impact of Physics on the society and development outside the scientific community.
<b>PSO5</b>	To inculcate the scientific temperament in the students and outside the scientific community.
<b>PSO6</b>	Use modern techniques, decent equipments and Phonics softwares.
<b>PSO7</b>	Attract outstanding students from all backgrounds.

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**Department of Zoology**

**Programme Specific Outcome**

<b>Sr. No.</b>	<b>Programme Specific Outcome</b>
PSO 1	Acquisition of knowledge of animal science to the pupils
PSO 2	Acquisition of the knowledge of nutrition, agriculture & live stock in their daily life
PSO 3	Awareness of natural resources and environment
PSO 4	Aptitude for scientific work & ability to pursue studies far beyond graduation
PSO 5	Life science as a career, which is the need now-a-day
PSO 6	Applications of scientific principles for organization of scientific exhibitions and competitions
PSO 7	Presentation skills and confidence in students
PSO 8	Skills in practical work, experiments, laboratory materials & handling of instruments
PSO 9	Interests in the subject
PSO 10	Enhancement of scientific attitude & scientific hobbies
PSO 11	Abilities to apply scientific methods, collection of scientific data, problem solving, Research Paper Writing, etc
PSO 12	Appreciation of the subject, contributions of scientists, scientific methods, scientific programs, etc

  
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**Department of Chemistry**  
**Course Outcomes**

Sr. No.	Class	Paper No.	Title of the Paper	Course Outcome
<b>1</b>	<b>B.Sc. I</b>	DSC-3A- Chemistry paper I	Inorganic Chemistry	<ol style="list-style-type: none"> <li>1. Acquisition of knowledge Atomic Structure and Periodicity of Elements.</li> <li>2. Learning and Understanding chemical bonding and molecular structure, Ionic Bonding.</li> <li>3. Learning and Understanding chemical bonding and molecular structure valence bond theory (VBT).</li> <li>4. Learning and Understanding chemical bonding and molecular structure molecular orbital theory (MOT).</li> </ol>
		DSC-4A- Chemistry paper II	Organic Chemistry	<ol style="list-style-type: none"> <li>1. Understanding fundamentals of organic chemistry, Generation, Structure, Stability and Reactions of Reactive Intermediates such as Carbocations, Carbanions and carbon free radicals.</li> <li>2. Learning and Understanding types of Stereoisomerism, Optical Isomerism, Concept of Chirality, Elements of Symmetry, nomenclature of stereoisomers.</li> <li>3. Understanding Aromaticity of organic compounds and Mechanism of Electrophilic substitution reactions: Nitration, Sulphonation, Halogenation and Friedel craft reaction.</li> <li>4. Learning and Understanding Cycloalkanes, cycloalkenes and alkadienes.</li> </ol>
		DSC 3B: Chemistry Paper-III	Physical Chemistry	<ol style="list-style-type: none"> <li>1. Inculcation of Knowledge of chemical energetics.</li> <li>2. Inculcation of Knowledge of chemical equilibrium.</li> <li>3. Learning and understanding kinetic theory of gases and derivation of the kinetic gas equation.</li> <li>4. Able to understand order of reaction.</li> <li>5. Able to understand theories of reaction rates</li> </ol>
		DSC-4B- Chemistry Paper IV	Analytical Chemistry	<ol style="list-style-type: none"> <li>1. Inculcation of Knowledge of Importance of analysis, Analytical processes, Methods of analysis, Sampling of solids, liquids and</li> </ol>

				<p>gases, Errors, accuracy, Significant figures, mean, median, standard deviation.</p> <ol style="list-style-type: none"> <li>2. Understanding basic Principle of chromatography, Classification of chromatography.</li> <li>3. Understanding theory of titrimetric analysis.</li> <li>4. Inculcation of Knowledge of Water Analysis.</li> <li>5. Understanding necessity and requirements of good fertilizers.</li> </ol>
2	B. Sc. II	<p><b>Paper No. DSC- C3 - Chemistry paper No. V</b></p>	<p><b>Physical Chemistry</b></p>	<ol style="list-style-type: none"> <li>1. Learning and understanding conductivity and transport number of the aqueous solutions with</li> <li>2. Knowledge about surface tension, viscosity and refractive index will be gained by the student.</li> <li>3. Learning and understanding surface phenomena at heterogeneous surfaces.</li> <li>4. Learning the various Nuclear phenomena and measurement of nuclear radiations.</li> <li>5. Learning and understanding the knowledge about third order reaction and theories of reaction rates.</li> </ol>
		<p><b>Paper No. DSC-C4- Chemistry paper No. VI</b></p>	<p><b>Industrial Chemistry</b></p>	<ol style="list-style-type: none"> <li>1. Learning and Understanding basic concepts and concentration terms. Distinguish between classical and industrial chemistry</li> <li>2. Students can understand Knowledge of some unit operations.</li> <li>3. Student Understanding the process of corrosion.</li> <li>4. Knowledge of Indian paper industry.</li> <li>5. To understand Knowledge about the chemical nature and cleansing action of soap.</li> </ol>
		<p><b>Paper No. DSC-D3- Chemistry paper No. VII</b></p>	<p><b>Inorganic Chemistry</b></p>	<ol style="list-style-type: none"> <li>1. Learning and Understanding basic concepts about coordination complexes.</li> <li>2. Knowledge about application of chelates in analytical chemistry.</li> <li>3. Understanding the properties of P – block Elements.</li> <li>4. Student will be capable of understanding</li> </ol>



				<p>the properties of 3d series elements.</p> <p>5. Student will learn the basic knowledge about the qualitative analysis of inorganic Compounds.</p>
		<p><b>Paper No. DSC- D4 - Chemistry paper No. VIII</b></p>	<p><b>Organic Chemistry</b></p>	<ol style="list-style-type: none"> <li>1. To impart knowledge about the synthesis, reactivity and applications of carboxylic acids.</li> <li>2. Student will be capable of understanding the nomenclature and reactivity of aldehydes and ketones.</li> <li>3. Student will learn the basic knowledge conformational analysis of organic compounds.</li> <li>4. Students can able to understand classification, configuration and structure of carbohydrates.</li> <li>5. Knowledge about classification, preparation and applications of amines and diazonium salts.</li> </ol>
3	B.Sc. III	<p><b>Paper No. DSE-E5, Chemistry Paper No. -IX</b></p>	<p>Inorganic Chemistry</p>	<ol style="list-style-type: none"> <li>1. Useful for the study of role of acids and bases in Chemistry.</li> <li>2. The study of non -aqueous solvents is important to learn all chemical properties of solutes and from the research point of view.</li> <li>3. Useful to understand geometry, stability and nature of bonding between metal ion and ligand in complexes.</li> <li>4. The topic deals with the synthesis and the applications of the semiconductors and Superconductors in electrical and electronic devices.</li> <li>5. The structure, method of preparation and the applications of organo metallic compound in various fields are explained.</li> <li>6. The classification, types, mechanism and applications of catalyst in industrial fields is explained.</li> </ol>
		<p><b>Paper No. DSE-E6 Chemistry Paper No. X</b></p>	<p>Organic Chemistry</p>	<ol style="list-style-type: none"> <li>1. Understanding of energy associated with electromagnetic radiation and its use in analytical technique.</li> <li>2. Knowledge of chromophore, auxochrome and calculation of <math>\lambda_{max}</math>.</li> <li>3. Knowledge of vibrational transitions,</li> </ol>

				<p>regions of IR spectrum, functional group recognition.</p> <ol style="list-style-type: none"> <li>Understanding of magnetic-non magnetic nuclei, shielding-deshielding, chemical shift, splitting pattern.</li> <li>Knowledge of molecular ion, fragmentation pattern and different types of ions produced.</li> <li>Student will predict the structure of organic compound with the help of provided spectral data.</li> </ol>
		<p><b>Paper No. DSE- E7 Chemistry Paper No. XI</b></p>	Physical Chemistry	<ol style="list-style-type: none"> <li>Learning and understanding quantum Chemistry.</li> <li>Knowledge about spectroscopy, Electromagnetic spectrum, Energy level diagram, Study of rotational spectra of diatomic molecules</li> <li>Learning and understanding photochemical laws, reactions and various photochemical phenomena.</li> <li>Learning the various types of solutions, relations vapour pressure, temperature relations.</li> <li>Learning and understanding the knowledge of emf measurements, types of electrodes, different types of cells, various applications of emf measurements.</li> </ol>
		<p><b>Paper No. DSE-E8 Chemistry paper No. XII</b></p>	Analytical Chemistry	<ol style="list-style-type: none"> <li>Learning and understanding the techniques of gravimetric analysis.</li> <li>Knowledge of instrumental analysis of alkali and alkaline earth elements.</li> <li>Understanding, working and applications of optical methods as an analytical tool.</li> <li>Understanding theory and applications of potentiometric titrations.</li> <li>Understanding the basics of ion exchange and column adsorption chromatography, Quality control practices in analytical industries / laboratories.</li> </ol>
		<p><b>Paper No. DSE-F5, Chemistry Paper No. -XIII</b></p>	Inorganic Chemistry	<ol style="list-style-type: none"> <li>Understand the thermodynamic and kinetic aspects of metal complexes.</li> <li>Understand role of radio isotopes in medicinal, industrial and Archaeology fields</li> <li>Learning and understanding the characteristics, properties and separation</li> </ol>

			<p>of lanthanides and Actinides.</p> <ol style="list-style-type: none"> <li>Understanding techniques involve in ore dressing and extraction of cast iron from its ore.</li> <li>Knowledge about role of various metals and non metals in our health</li> </ol>
		<p><b>Paper No. DSE-F6 Chemistry Paper No. XIV</b></p> <p>Organic Chemistry</p>	<ol style="list-style-type: none"> <li>Knowledge of reagents used in organic transformations and various reactions used in organic synthesis.</li> <li>Knowing basic terms used in retrosynthetic analysis, retrosynthesis of some organic compounds.</li> <li>Student will learn addition reaction across <math>&gt;C=C&lt;</math> and <math>-C\equiv C-</math> bond</li> <li>Knowledge of terpenoids and alkaloids w.r.t. occurrence, isolation, characteristics and classification.</li> <li>Understanding classification of drugs, Qualities of ideal drug. Synthesis and uses of some representative drugs and Drug action of sulphadiazine.</li> </ol>
		<p><b>Paper No. DSE-F 7 Chemistry Paper No. XV</b></p> <p>Physical Chemistry</p>	<ol style="list-style-type: none"> <li>Learning and understanding of phase rule, learning of One component, Two component and Three component systems phase diagrams with suitable examples.</li> <li>Knowledge about basic concept of Thermodynamics, free energy, Gibbs-Helmholtz equation and its applications, problem related with it.</li> <li>Learning and understanding Space lattice, lattice sites, Lattice planes, Unit cell.</li> <li>Learning of kinetics, Simultaneous reactions such as i)opposing reaction ii)side reaction iii)consecutive reactions: iv) chain reaction v) explosive reaction</li> <li>Learning and understanding the knowledge of distribution law, its modifications, applications of distribution laws.</li> </ol>
		<p><b>Paper No. DSE-F8 Chemistry Paper No. XVI</b></p> <p>Industrial Chemistry</p>	<ol style="list-style-type: none"> <li>Learning and understanding the whole process of manufacture of sugar and byproducts of sugar industry.</li> <li>Learning and understanding of physicochemical principles of production of ammonia, sulfuric acid, nitric acid and sodium carbonate along with its</li> </ol>



				manufacturing plant. 3. Understanding and learning the classification, synthesis and applications of various polymers. 4. Understanding the petroleum Industry, fuels and need of use of ecofriendly fuels. 5. Understanding and learning of nanotechnology.
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## Course Outcome

Sr. No.	Class	Theory Paper No.	Title of the Paper	Course Outcome
1	<b>B. Sc. I</b>	DSC 13 A. I	Biodiversity of Microbes, Algae and Fungi	CO1. Aptitude for identification of microbes, algae & fungi CO2. Acquisition of knowledge of ultra structure & economic importance of above group
2		DSC 14 A. II	Biodiversity Of Archegoniate-Bryophytes, Pteridophytes and Gymnosperms.	CO1. Aptitude for identification of Archegoniates CO2. Acquisition of knowledge of ultra structure & economic importance of above group
3		DSC 13 B. III	Plant Ecology	CO1. Acquisition of knowledge of evolution radiations CO2. Acquisition of knowledge of succession of plant community and Ecosystem
4		DSC 14 B. IV	Plant Taxonomy	CO1. Acquisition of knowledge of Plant nomenclature by ICBN. Ex situ conservation of plants via Botanical Gardens CO2. To follow the accepted system of classification of Angiosperm
		<b>Practical</b>		Acquisition of practical knowledge increases skills and working ability of students to perform experiments on plants.
5	<b>B. Sc. II</b>	DSC 13 C. V	Embryology of Angiosperms	CO1. Acquisition of knowledge of pollination biology and plant insect relationship CO2. Aware about embryology of Angiosperm
6		DSC 14 C. VI	Plant Physiology	CO1. To know the plant water relationship and role of minerals as a nutrition in plants CO1. Acquisition of knowledge of carbon reduction pathways and significance of photosynthesis CO1. Acquiring knowledge of plant growth regulators and their practical application

  
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7		DSC 13 D. VII	Plant Anatomy	CO1. Acquiring basic knowledge of tissue system in higher plants CO2. Acquiring the knowledge of different tissues and their role in higher plants. CO3. Acquiring the knowledge of adaptive radiation in tissue system
8		DSC 14 D. VIII	Plant Metabolism	CO1. Acquiring the through knowledge of enzymes. CO2. Acquiring the knowledge of mechanism of enzyme action, structure and properties of enzymes. CO3. Role of Nitrogen in plant metabolism CO4. Role of respiration CO5. Acquiring the knowledge of breaking seed dormancy
		<b>Practical</b>		Acquisition of practical knowledge increases skills and working ability of students to perform experiments on plants.
9	<b>B. Sc. III</b>	DSC- E 25. IX	Genetics and Plant Breeding	CO1. Acquiring the knowledge of genetics and methods of breeding techniques in crop plants
10		DSC- E 26 X	Microbiology, Plant pathology and Mushroom Culture Technology	CO1. Acquiring the basic procedure in the field of microbiology and plant pathology. CO2. Acquiring technology of mushroom cultivation
11		DSC-E 27 XI	Cytology and Research Techniques in Biology	CO1. Acquiring knowledge of cell biology CO2. Ability to handle various instruments in biological research such as SEM, Spectrometer, micrometer
12		DSC- E 28 XII	Horticulture and Gardening	CO1. To develop the skills in horticulture including nursery, landscaping, gardening, floriculture CO2. Students will be able to demonstrate their knowledge, skills and attributes in horticultural profession.
13		DSC- F25 XIII	Plant Biochemistry and molecular Biology	CO1. Students are acquainted with basic as well as recent knowledge in the field of molecular biology
14		DSC- F 26 XIV	Bioinformatics, Biostatistics and Economic Botany	CO1. Acquisition of knowledge of bioinformatics, biostatistics and economic botany CO2. Students are aware about spices, beverages and fibers, cereals, legumes and



			oils
15	DSC- F 27 XV	Plant Biotechnology and Paleobotany	CO1. Acquisition of knowledge of plant biotechnology, protoplast culture and recombinant DNA technology (research methodology) CO2. Acquainted the scope of Paleobotany in the present scenario and understand the fossil genera.
16	DSC- F 28 XVI	Bio fertilizers and Herbal Drug Technology	CO1. Acquisition of basic knowledge of biofertilizers, herbal drug technology CO2. Student become familiar with organic manures, herbal medicines, herbal cosmetology and pharmacognocny
	<b>Practical</b>		Acquisition of practical knowledge increases skills and working ability of students to perform experiments on plants.

  
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### Course Outcomes (CO)

Faculty: B. Sc.

Name of the Department / Subject: Mathematics

Year: I (CBCS)

Paper Code (As per the syllabus of Shivaji University)	Name of the Paper	Outcome
DSC - 5A	Differential Calculus	<ul style="list-style-type: none"><li>• Student will be able to apply De-Moivre's Theorem and properties of hyperbolic functions.</li><li>• Student will be able to apply notion of successive derivatives and partial derivatives which arise in all applied sciences</li><li>• Student will be able to solve extreme value problems using Lagrange's method</li></ul>
DSC - 6A	Calculus	<ul style="list-style-type: none"><li>• Students will be acquainted with some basic concepts of Calculus like Mean value theorems, limit and continuity of functions.</li><li>• Students will learn to use of L - Hospital's rule.</li><li>• Students will understand and learn the concept of differentiation of function of single variable.</li></ul>
DSC - 5B	Differential Equations	<ul style="list-style-type: none"><li>• Students will understand various types of ordinary differential equations of first order and first degree and methods to solve them.</li><li>• Students will learn various types and methods to solve linear differential equations with constant coefficients.</li><li>• Students will understand Cauchy - Euler differential equation, Legendre's linear differential equation and methods to solve them.</li></ul>

DSC – 6B	Higher Order differential Equations and Partial differential Equations	<ul style="list-style-type: none"> <li>• Students will learn methods to solve second order differential equations, ordinary simultaneous differential equations and Total differential equations.</li> <li>• Students will understand difference between ordinary and partial differential equations.</li> <li>• Students will learn various types and methods to solve partial differential equation.</li> <li>• Students will learn Lagrange's method, Charpit's method.</li> </ul>
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**Course Outcomes (CO)**

**Faculty: B. Sc.**

**Name of the Department / Subject: Mathematics**

**Year: II (CBCS)**

<b>Paper Code (As per the syllabus of Shivaji University)</b>	<b>Name of the Paper</b>	<b>Outcome</b>
DSC – 5C	Real Analysis - I	<ul style="list-style-type: none"> <li>• Students will be able to understand types of functions and how to identify them.</li> <li>• Students will be able to use mathematical induction to prove various properties.</li> <li>• Students will be able to understand the basic ideas of Real Analysis.</li> <li>• Students will be able to prove and apply order properties of real numbers, completeness property and the Archimedean property.</li> </ul>
DSC – 6C	Algebra - I	<ul style="list-style-type: none"> <li>• Students will understand different types and properties of matrices.</li> <li>• Students will be able to solve homogeneous and non-homogeneous system of linear equations.</li> <li>• Students will be able to find Eigen values and Eigen vectors of a matrix.</li> <li>• Students will learn to classify the various types of groups, subgroups and their</li> </ul>



		properties.
DSC - 5D	Real Analysis - II	<ul style="list-style-type: none"> <li>• Students will understand sequence and its properties pertaining to convergence.</li> <li>• Students will understand The Bolzano-Weierstrass Theorem, Cauchy Convergence Criterion.</li> <li>• Students will understand convergence of series and able to solve the related problems</li> <li>• Students will be able to apply different tests of convergence of series.</li> </ul>
DSC - 6D	Algebra - II	<ul style="list-style-type: none"> <li>• Students will understand Lagrange's theorem and various properties of subgroups.</li> <li>• Students will learn modular arithmetic and be able to apply Fermat's and Euler's theorem</li> <li>• Students will understand properties of normal subgroups, factor group.</li> <li>• Students will understand homomorphism and isomorphism in groups and rings.</li> <li>• Students will be able to derive basic properties of rings and subrings.</li> </ul>

**Course Outcomes (CO)**

**Faculty: B. Sc.**

**Name of the Department / Subject: Mathematics**

**Year: III (SEM V)**

<b>Paper Code (As per the syllabus of Shivaji University)</b>	<b>Name of the Paper</b>	<b>Outcome</b>
Paper IX	Real Analysis	Students will <ul style="list-style-type: none"><li>• understand the convergence and divergence of sequence and series of real numbers.</li><li>• understand the integration of bounded function on a closed and bounded interval.</li><li>• understand some families of Riemann integrable functions and properties of integration.</li><li>• be able to determine integrability of a function.</li><li>• understand extension of Riemann integral to the improper integrals.</li></ul>
Paper X	Modern Algebra	Students will be able to <ul style="list-style-type: none"><li>• understand basic concepts of group theory and its different examples.</li><li>• identify whether the given set with the compositions form Ring, Integral domain or field.</li><li>• understand the difference between the concepts Group and Ring.</li><li>• apply fundamental theorem, Isomorphism theorems of groups and Rings.</li></ul>
Paper XI	Partial Differential Equations	Students will be able to <ul style="list-style-type: none"><li>• form and solve linear partial differential equations.</li><li>• solve nonlinear partial differential equation.</li><li>• understand and solve linear homogeneous partial differential equation with</li></ul>

		constant coefficients.
Paper XII	Numerical Methods I	<p>Students will be able to</p> <ul style="list-style-type: none"> <li>• find solution of nonlinear equations using different methods and compare the accuracy.</li> <li>• find solution linear equations using iterative and non-iterative numerical methods.</li> <li>• determine numerically Eigen values and Eigen vectors of a given matrix.</li> </ul>

**(SEM VI)**

Paper Code (As per the syllabus of Shivaji University)	Name of the Paper	Outcome
Paper XIII	Metric Spaces	<p>Students will be able to</p> <ul style="list-style-type: none"> <li>• understand the generalization of distance to metric notion with examples.</li> <li>• appreciate the process of abstraction of limits and continuity to metric spaces.</li> <li>• understand the interconnection within metric concept, open sets, closed sets and continuity.</li> <li>• understand the properties of connected sets, compact sets, complete sets and apply them to explore properties of continuous functions on compact sets and uniform continuity.</li> </ul>



Paper XIV	Linear Algebra	<p>Students will be able to</p> <ul style="list-style-type: none"> <li>• understand notion of vector space, subspace, basis.</li> <li>• understand concept of linear transformation and its application to real life situation.</li> <li>• work out algebra of linear transformations.</li> <li>• appreciate connection between linear transformation and matrices.</li> </ul>
Paper XV	Complex Analysis	<p>Students will be able to</p> <ul style="list-style-type: none"> <li>• understand basic concepts of functions of complex variable and analytic functions.</li> <li>• understand concept of complex integration and basic results thereof.</li> <li>• understand concept of sequence and series of complex variable.</li> <li>• apply concept of residues to evaluate certain real integrals.</li> </ul>
Paper XVI	Numerical Methods II	<p>Students will be able to</p> <ul style="list-style-type: none"> <li>• find solution of interpolation problem with equal interval and unequal interval.</li> <li>• find solution of a definite integration using different numerical methods for it.</li> <li>• find solution of ordinary differential equations using different numerical methods for it.</li> </ul>



**Head**  
 Department of Mathematics  
 Amdar Shashikant Shinde  
 Mahavidyalay, Medha



# Amdar Shashikant Shinde Mahavidyalaya, Medha

## Dept. of Microbiology

### Course Outcome

Sr. No.	Class	Paper No.	Title of Paper	Course Outcome
1	B.Sc.I	I	DSC-25 A Introduction to Microbiology	<ul style="list-style-type: none"> <li>Acquisition of knowledge of historical events in Microbiology and applied branches of Microbiology.</li> <li>Aptitude for identification of taxonomic classification of microorganisms.</li> <li>Acquisition of knowledge of different microscopes and their uses along with stains used in microbial staining procedures.</li> </ul>
2		II	DSC-26 A Microbial Diversity	<ul style="list-style-type: none"> <li>Aptitude for identification of all types of microorganisms with their properties, mode of nutrition, reproduction and occurrence.</li> <li>Acquisition of knowledge of controlling microorganisms by chemical and physical agents as well as types of microbial nutrition and culture media used in microbial procedures.</li> </ul>
3		III	DSC- 25 B Bacteriology	<ul style="list-style-type: none"> <li>Acquisition of knowledge of cytology and morphology of microorganisms.</li> <li>Isolation and preservation techniques of microorganisms.</li> </ul>
4		IV	DSC-26 B Microbial Biochemistry	<ul style="list-style-type: none"> <li>Acquisition of knowledge of biomolecules like protein, carbohydrates, lipids, enzymes and nucleic acid.</li> <li>Aptitude for identification of different pathways of microbial metabolism like EMP, TCA and ETC.</li> </ul>
5	B.Sc.II	V	DSC- 25C Microbial physiology and metabolism	<ul style="list-style-type: none"> <li>Acquisition of knowledge about growth phases of bacteria, effect of environmental factors on microbial growth and transport systems of microorganisms.</li> <li>Aptitude for identification of microbial</li> </ul>

				metabolism by different pathways like EMP, HMP, ED, TCA etc. and Fermentation.
6		VI	DSC-26 C Applied Microbiology	<ul style="list-style-type: none"> <li>Acquisition of knowledge of applied branches of Microbiology like Air, Water and Milk Microbiology.</li> <li>Acquisition of knowledge of types of fermentations, fermenters and detailed fermentation process under industrial Microbiology.</li> </ul>
7		VII	DSC- 25 D Microbial Genetics and Molecular Biology	<ul style="list-style-type: none"> <li>Acquisition of knowledge of microbial genetics and types of mutations.</li> <li>Operon concept and gene transfer mechanisms in bacteria.</li> </ul>
8		VIII	DSC- 26 D Basics in medical microbiology and immunology	<ul style="list-style-type: none"> <li>Aptitude for identification of different terminologies in medical microbiology along with types of diseases.</li> <li>Acquisition of knowledge for basic concepts in immunology- antigen, antibody, innate and acquired immune response as well as non-specific defense mechanisms.</li> </ul>
9	B.Sc.III	IX	DSE-49 E Virology	<ul style="list-style-type: none"> <li>Acquisition of knowledge of viral structures, isolation and cultivation techniques of animal and plant viruses.</li> <li>Acquisition of knowledge of bacteriophages, their reproduction and lysogeny.</li> <li>Aptitude for identification of oncogenic viruses, different theories of oncogenesis and characteristics of cancer cell.</li> </ul>
10		X	DSE-50 E Immunology	<ul style="list-style-type: none"> <li>Acquisition of knowledge of different types of immune cells and organs.</li> <li>Acquisition of knowledge of molecular mechanisms of antibody production, complement system, monoclonal antibody.</li> <li>Aptitude for identification of different hypersensitivity reactions under Gell and Coombs Classification and autoimmunity.</li> </ul>
11		XI	DSE-51 E Food	<ul style="list-style-type: none"> <li>Acquisition of knowledge of different</li> </ul>



			and Industrial Microbiology	<p>food poisonings and food borne infections due to microorganisms.</p> <ul style="list-style-type: none"> <li>• Acquisition of knowledge of food preservation techniques used in industry, microbial preservation techniques.</li> <li>• Aptitude for identification of different industrial productions using fermentation technology.</li> </ul>
12		XII	DSE-52 E Agricultural Microbiology	<ul style="list-style-type: none"> <li>• Aptitude for identification of role of microorganisms in soil fertility, elemental cycles and microbial interactions.</li> <li>• Acquisition of knowledge of biofertilizers, biopesticides and different plant diseases.</li> </ul>
13		XIII	DSE-49 F Microbial Genetics	<ul style="list-style-type: none"> <li>• Acquisition of knowledge of basic concepts in microbial genetics, mutations and methods of isolation of mutants.</li> <li>• Acquisition of knowledge of genetic complementation, extrachromosomal inheritance and genetic engg.</li> </ul>
14		XIV	DSE-50 F Microbial Biochemistry	<ul style="list-style-type: none"> <li>• Aptitude for identification of different types of enzymes, structures of enzymes and purification techniques of enzymes as well as assays of enzymes.</li> <li>• Acquisition of knowledge of Microbial metabolism through different pathways like PP, ED, PK, Glyoxylate Bypass etc.</li> </ul>
15		XV	DSE-51 F Environmental Microbiology	<ul style="list-style-type: none"> <li>• Acquisition of knowledge of waste management, different types of waste and its characteristics, treatment of waste.</li> <li>• Understand the environmental aspects of microbial control and bioremediation.</li> </ul>
16		XVI	DSE-52 F Medical Microbiology	<ul style="list-style-type: none"> <li>• Acquisition of knowledge of morphological, biochemical characters and mode of transmission of different microorganisms in causing disease, chemotherapy and the concepts of gene therapy.</li> </ul>

  
 Department of Microbiology  
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 Mahavidyalay, Medha





**Amdar Shashikant Shinde Mahavidyalay, Medha**  
**Department of Physics**  
**Course Outcome**

Sr. No.	Class	Paper No.	Course	Outcomes
1	B. Sc. I	I	DSC-1A MECHANICS -I	<p><b>CO1:</b> Revise the knowledge of vectors and differential equations.</p> <p><b>CO2:</b> Acquire knowledge of methods to solve partial differential equations with the examples of important partial differential equations in Physics.</p> <p><b>CO3:</b> Develop an understanding of how to formulate a physics problem and solve given mathematical equation risen out of it.</p> <p><b>CO4:</b> Learn the concept of conservation of energy, momentum, angular momentum and apply them to basic problems.</p> <p><b>CO5:</b> Understand the analogy between translational and rotational dynamics.</p> <p><b>CO6:</b> Write the expression for the moment of inertia about the given axis of symmetry for spherical shell and solid cylinder.</p>
2		II	DSC-2A MECHANICS - II	<p><b>CO1:</b> Understand laws of motion and their application to various dynamical situations.</p> <p><b>CO2:</b> Apply Kepler's law to describe the motion of planets and satellite in circular orbit, through the study of law of Gravitation.</p> <p><b>CO3:</b> Develop skills to understand and solve the equations of Newtonian Gravity and central force problem.</p> <p><b>CO4:</b> Acquire basic knowledge of oscillation, Elasticity and Surface tension and their applications in various fields.</p>
3		III	DSC- 1B ELECTRICITY AND MAGNETISM I	<p><b>CO1:</b> Demonstrate Gauss law, Coulomb's law for the electric field.</p> <p><b>CO2:</b> Apply Gauss's law of electrostatics to solve a variety of problems.</p> <p><b>CO3:</b> Articulate knowledge of electric current, resistance and capacitance in terms of electric field and electric potential.</p> <p><b>CO4:</b> Demonstrate a working understanding of capacitors.</p> <p><b>CO5:</b> Understanding of Gauss Theorem in the dielectric.</p> <p><b>CO6:</b> Understand the vector calculus and its application in classical physics.</p>

4		IV	<b>DSC- 2B ELECTRICITY AND MAGNETISM II</b>	<p><b>CO1:</b> Understand magnetic properties of materials and the phenomena of electromagnetic induction.</p> <p><b>CO2:</b> Explain Faraday-Lenz and Maxwell laws to articulate the relationship between electric and magnetic fields.</p> <p><b>CO3:</b> Achieve an understanding of the Maxwell's equations, role of displacement current and use electromagnetic theory and principles in a wide range of applications.</p> <p><b>CO4:</b> Understand of complex numbers and their application of solving a.c. series LCR circuit.</p> <p><b>CO5:</b> Demonstrate Biot-Savart's law for the magnetic field.</p> <p><b>CO6:</b> Understand basic concepts of electricity and magnetism and their applications.</p>
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Sr. No.	Class	Paper No.	Course	Outcomes
1	B.Sc. II	V	<b>DSC-C1 THERMAL PHYSICS AND STATISTICAL MECHANICS – I</b>	<p><b>CO1:</b> Learn about kinetic theory of gases and thermometry.</p> <p><b>CO2:</b> Know about laws of thermodynamics.</p>
2		VI	<b>DSC-C2: WAVES AND OPTICS – I</b>	<p><b>CO1:</b> Understanding of linearity and superposition principal.</p> <p><b>CO2:</b> Know About energy transfer in coupled oscillator.</p> <p><b>CO3:</b> Get knowledge of wave motion and ultrasonic waves.</p>
3		VII	<b>DSC-D1 THERMAL PHYSICS AND STATISTICAL MECHANICS – II</b>	<p><b>CO1:</b> Understanding of the thermodynamic potentials.</p> <p><b>CO2:</b> Get knowledge about the laws of radiation.</p> <p><b>CO3:</b> Understand the classical and quantum statistics.</p>
4		VIII	<b>DSC- D2 - WAVES AND OPTICS-II</b>	<p><b>CO1:</b> learn about cardinal points of optical system.</p> <p><b>CO2:</b> Understand the concept of resolving power of optical instruments.</p> <p><b>CO3:</b> Get idea about polarization.</p> <p><b>CO4:</b> Get knowledge of Mosley's experimental work, Mosley's diagram and law.</p> <p><b>CO5:</b> Understand the light phenomenon like interference and diffraction.</p>

Sr. No.	Class	Paper No.	Course	Outcomes
1	B.Sc. III	IX	DSE-E1 Mathematical Physics	<p><b>CO1:</b> Acquire knowledge of methods to solve partial differential equations with the examples of important partial differential equations in Physics.</p> <p><b>CO2:</b> Understand the Frobenius Method and Special Functions.</p> <p><b>CO3:</b> Understand Some Special Integrals.</p> <p><b>CO4:</b> Learn the concept of complex analysis.</p>
		X	DSE-E2 Quantum Mechanics	<p><b>CO1:</b> Understand the matter wave concept and uncertainty principal.</p> <p><b>CO2:</b> Derive Schrodinger's time dependent and independent equations.</p> <p><b>CO3:</b> Solve the problems using Schrödinger's steady state equation.</p> <p><b>CO4:</b> Understand different operators in Quantum Mechanics.</p> <p><b>CO5:</b> Solve Schrodinger's equation for Hydrogen atom in spherical polar coordinates.</p> <p><b>CO6:</b> Understand the significance of quantum numbers.</p>
		XI	DSE-E3 Classical Mechanics and Classical Electrodynamics	<p><b>CO1:</b> Learn the concept of conservation of energy, momentum, angular momentum and apply theorem to basic problems.</p> <p><b>CO2:</b> Understands Lagrangian and Hamiltonian formulation.</p> <p><b>CO3:</b> Solve the problems using Lagrangian and Hamiltonian formulation.</p> <p><b>CO4:</b> Acquire knowledge about special theory of relativity and charged particle dynamics.</p>
		XII	DSE-E4 Digital and Analog Circuits and Instrumentation	<p><b>CO1:</b> Understanding of Basic working of an oscilloscope including its different components and to employ the same to study different wave forms and to measure voltage, current, frequency and phase.</p> <p><b>CO2:</b> Know About digital systems, fundamental logic gates.</p> <p><b>CO3:</b> Understand Operational amplifiers and knowledge about different configurations namely inverting and non-inverting and applications of operational amplifiers.</p> <p><b>CO4:</b> How to construct oscillators.</p>

Sr. No.	Class	Paper No.	Course	Outcomes
1	B.Sc. III	XIII	DSE-F1 Nuclear and Particle Physics	<p><b>CO1:</b> Learn about the detectors of nuclear radiations- the Geiger-Mueller counter, the scintillation counter, Bubble chamber, Wilson cloud chamber detectors.</p> <p><b>CO2:</b> The students are expected to learn about the principles and basic constructions of particle accelerators such as cyclotron, betatron and synchrotron. They should know about the accelerator facilities in India.</p> <p><b>CO3:</b> Learn the ground state properties of a nucleus – the constituents and their properties, mass number and atomic number, relation between the mass number and the radius and the mass number, average density, range of force, saturation property, stability curve, the concepts of packing fraction and binding energy, binding energy per nucleon vs. mass number graph, explanation of fusion and fission from the nature of the binding energy graph.</p> <p><b>CO4:</b> Learn the basic aspects of nuclear reactions, the Q-value of such reaction and its derivation from conservation laws, The reaction cross-sections, the types of nuclear reactions.</p> <p><b>CO5:</b> Gain knowledge on the basic aspects of particle Physics.</p>
2		XIV	DSE-F2 Solid State Physics	<p><b>CO1:</b> A brief idea about crystalline and amorphous substances, about lattice, unit cell, miller indices, reciprocal lattice.</p> <p><b>CO2:</b> Knowledge of lattice vibrations.</p> <p><b>CO3:</b> Understanding above the band theory of solids and must be able to differentiate insulators, conductors and semiconductors.</p>
3		XV	DSE-F3 Atomic and Molecular Physics and Astrophysics	<p><b>CO1:</b> Understand molecular spectra of atom</p> <p><b>CO2:</b> Study the Raman effect</p> <p><b>CO3:</b> Study the Zeeman effect</p> <p><b>CO4:</b> Acquire the knowledge of Milky way and Galaxies, their properties and structure.</p> <p><b>CO5:</b> Understand the Hubble law and cosmological tests.</p> <p><b>CO6:</b> Get knowledge about the big-bang cosmology.</p>



4		XVI	<b>DSE-F4 Energy Studies and Materials Science</b>	<b>CO1:</b> Learn about some of the renewable sources of energy which should be studied here are: (I) off-shore wind energy, (II) tidal energy, (III) solar energy. <b>CO2:</b> Understand the concept of atomic disorder in materials. <b>CO3:</b> Acquire the knowledge about superconductivity.
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Head  
Department of Physics  
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**Jaywant Pratishthan Humgaon Sanchalit**  
**Amdar Shashikant Shinde Mahavidyalay, Medha**  
**Department of Zoology**  
**Course Outcomes**

Sr. No.	Class	Paper No.	Title of the Paper	Course Outcome
1	B. Sc. I	I	DSC 15A Animal Diversity I	1. Aptitude for identification of Animals as per Scientific Classification. 2. Acquisition of knowledge of anatomy and histology of different animals from various groups of Kingdom Animalia
2		II	DSC 16A Animal Physiology	1. Acquisition of knowledge of basic physiology and its relation to daily life. 2. Aptitude for identification of alteration in physiological processes by knowing symptoms of various diseases.
3		III	DSC 15B Cell Biology and Evolutionary Biology	1. Inculcation of Knowledge of Cell as well as structure and function of its organelles. 2. Understanding various evolutionary theories and its relevance with present evidences.
4		IV	DSC 16B Genetics	1. Inculcation of Knowledge of Genetics to solve criminal cases like pedigree analysis.
5	B. Sc. II	V	DSC 15C Animal Diversity II	1. Aptitude for identification of Animals as per Scientific Classification. 2. Acquisition of knowledge of anatomy and histology of different animals from various groups of Kingdom Animalia
6		VI	DSC 16C Biochemistry	1. Acquisition of knowledge of Biomolecules and their chemical processes.
7		VII	DSC 15D Reproductive Biology	1. Acquisition of knowledge of anatomy and histology of reproductive organs in human being. 2. Acquisition of knowledge of process of reproduction and its hormonal control in human being. 3. Inculcation of Knowledge of assistive reproductive technology for human being.
8		VIII	DSC 16D Applied Zoology I	1. Aptitude for identification of some pathogenic diseases and their control measures. 2. Acquisition of knowledge of host parasite

				relationship and its use in human welfare 3. Aptitude for application of modern technologies in poultry management and its use for human welfare.
9	B. Sc. III	IX	DSE-E29 (Comparative anatomy of vertebrates)	1. Acquisition of knowledge of vertebrate anatomy to compare and decide evolutionary relationship.
10		X	DSE-E30 (Molecular Cell Biology and Animal Biotechnology)	1. Aptitude for various processes of Nucleic acids and their role in cellular mechanism. 2. Acquisition of knowledge of molecular modeling and their use to improve quality of human life.
11		XI	DSE-E31 (Biotechniques and Biostatistics)	1. Aptitude for use of various scientific instruments for molecular modeling. 2. Acquisition of knowledge of Biostatistics for research.
12		XII	DSE-E32 (Aquatic Biology)	1. Acquisition of knowledge of aquatic environment for protection and conservation. 2. Inculcate the knowledge of hormones and hormone related diseases.
13		XIII	DSE-F29 (Developmental Biology of Vertebrates)	1. Acquisition of knowledge of developmental patterns of different economical and research important animals
14		XIV	DSE-F30 (Immunology)	1. Acquisition of knowledge of immune system to improve health status.
15		XV	DSE-F31 (Applied Zoology - II)	1. Social and Economical growth of individual by applying knowledge of Applied Zoology.
16		XVI	DSE-F32 (Insect Vectors and Histology)	1. Aptitude for identification of Insects as vectors and to know their life cycle for control of diseases. 2. Knowledge of internal organs to know the diseased/abnormal/infected/altered conditions.

  
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