Programme Outcomes	
At the end of the programme, student will be able to	
1	Explaining the basic scientific principles and methods.
2	Inculcating scientific thinking and awareness among the students
3	Ability to communicate with others in regional language and in English.
4	Ability to handle the unexpected situation by critically analyzing the problems.
5	Understanding the issue related to nature and environmental contexts and sustainable development.

Programme Specific Outcomes	
At the end of the programme, student will be able	
1	To understand the structure and importance of various organisms.
2	To differentiate between various groups of Algae, Fungi, Bacteria, Viruses, Lichens and Mycorrhiza.
3	Students will acquire knowledge of anatomy of root, stem and leaf.
4	Students will gain the knowledge of water and nutrients uptakes, role of minerals, plant regulators, seed germination and dormancy
5	Students will learn physiology of flowers and how to make herbarium, hydroponic and cultivation of mushroom, *Trichoderma* skills and Medicinal Plant Product Preparation Skill.
6	Students will gain the knowledge about the gene related diseases, different pathogens and plant/crops and human related diseases.
7	To production, utilization and improvement of floriculture and horticulture knowledge about important plants.

Course Outcomes

Subject: Botany

B. Sc. : SEMESTER- I, III, V

Class &Paper	Course code & course title	At the end of the course, student will be able to
B. Sc. I **(Semester-I)** Paper - I (T)	SBOTCT1101 Viruses, Bacteria and Algae	1. The students understand the morphology, structure, and evolution of various organisms like Viruses, Bacteria and Algae.
		2. The students are able to differentiate between various groups of Viruses, Bacteria and Algae.
		3. The students learn the importance of Viruses, Bacteria and Algae for human beings.
Paper -II (P)	SBOTCP1101 Practical Based on SBOTCT 1101	1.Students develop skill and technique for handling microscope and different instruments in the Botany lab.
		2. The students understand the morphology, structure, and interdependence of various organisms like Viruses, Bacteria and Algae.
B. Sc. I Skill based course	SBOTSC1101 *Trichoderma* cultivation Technique	1. Understanding the role of organic farming.
		2. Understanding the potential of *Trichoderma* as an alternative to chemical fertilizers
		3. Role of *Trichoderma* in protecting the environment and managing the waste.
B. Sc. I Generic Elective	SBOTGE1101 Medicinal Plants and	1. Understand history, Scope and Importance of Medicinal Plants & indigenous Medicinal Sciences
		2. Describe the common medicinal plants in the neighborhood for therapeutically use.

	their Uses-I	
		3. Conserve endangered and endemic medicinal plants.
		4. Efficient in modern tool use to get additional knowledge from the internet.
B. Sc. II **Semester-III** **Major** Paper - I	SBOTCT1201 Taxonomy of Angiosperms	1. The students understand the morphology, classification, and evolution of flowering plants. **Taxonomy of Angiosperms**
		2. The students differentiate between various families of flowering plants and their collection and preservation.
		3. The students learn the utilization of flowering plants for human welfare.
Practical **Major**	SBOTCP1201 Practical Based on paper SBOTCT1201	1. Students develop skill to study the flowering plants.
		2. The students understand the morphology and classification of flowering plants.
		3. The students learn the evolution of flowering plants and their utilization for human welfare.
B. Sc. II **Major** Paper - II	SBOTCT1202 Introductory Cell Biology	1. Students understand ultra structure of a cell, cell wall, cell membrane, cell organelles and chromosomes, cell cycle and cell division. **Introductory Cell Biology**
		2. The students understand in detail the structure of DNA and RNA and protein synthesis.
		3. Students acquire knowledge of cell and molecular biology.
Practical **Major**	SBOTCP1202 Practical Based on paper SBOTCT1202	1. Students understand the structure and function of cell and cell organelles.
		2. The students understand the morphology and behavior of genetic material.
		3. The students learn the nature and function of genetic material.
B. Sc. II **Minor** Paper - I	SBOTMT1201 Diversity of Cryptogams	1. Students understand the morphology, structure and importance Bryophytes and Pteridophytes.
		2. Students learn the evolutionary trends in plants and how they progressed from water to land; from gametophytes to sporophytes.
		3. Students are acquainted with development of vasculature in the plants.
Practical **Minor**	SBOTMP1201 Practical Based on paper SBOTMT1201	1. Students understand the morphology, structure and importance Bryophytes and Pteridophytes.
		2. Students learn the evolutionary trends in plants and how they progressed from water to land; from gametophytes to sporophytes.
		3. Students are acquainted with development of vasculature in the plants.
Generic Elective	SBOTGE 1201 Plants and Human Welfare-I	1. Understand the economically important plants.
		2. Understand the potential of plants for human welfare
		3. Understand the role of plants in human health.
Vocational Course	SBOTVC1201 Biofertilizers Technology	1. Understanding the role of organic farming.
		2. Understanding the potential of Biofertilizers as an alternative to chemical fertilizers
		3. Role of Biofertilizers in protecting the environment and managing the waste.
B.Sc. III **Semester-V** Paper- XII	DSCB-I: Cell and Molecular biology	1. The students will be able to understand ultra structure of a cell, cell wall, Cell membrane, cell organelles and chromosomes, cell cycle and cell division. 2. The students will be able to understand in detail the structure of DNA And RNA, protein synthesis, gene structure, gene mutation and related diseases.

		3. Students will acquire knowledge of cell and molecular biology
B.Sc. III Paper-XIII	DECB-I: Plant Pathology-I	1. The students will be able to understand fundamentals of plant pathology. 2. The students will be able to understand in detail the process of plant disease development. 3. Students will acquire knowledge of different plant diseases in different plants.
B.Sc. III Paper-XVI	DECBP-I: Practicals based on DECB-I & II	1. This program will train and orient the students in the field of Cell Biology, Molecular Biology, Plant Breeding
B.Sc. III Paper-XVII	DECBP-I: Practicals based on DECB-I & II	1. Students shall be able to identify different plant species, plant diseases and shall be able to do their management.
SECB- III	SEC-III: Medicinal Plant Product Preparation Skill	1. This will also develop specific skills amongst students for self employability through the development of their own enterprises.
B. Sc. : SEMESTER- II, IV, VI		
Class & Paper	**Course code & course title**	**At the end of the course, student will be able to**
B. Sc. I **Semester-II** Paper - III (T)	SBOTCT1151 Fungi, Lichens and Mycorrhiza	1. The students understand the morphology, structure, and interdependence of various organisms like Fungi, Lichens and Mycorrhiza.
		2. The students are able to differentiate between various groups of Fungi, Lichens and Mycoplasma.
		3. The students learn the importance of Fungi, Lichens and Mycoplasma for human beings.
Paper -IV (P)	SBOTCP1151 Practical Based on SBOTCT 1151	1. Students develop skill and technique for handling microscope and different instruments in the Botany lab.
		2. The students understand the morphology, structure, and interdependence of various organisms like Viruses, Bacteria, Algae, Fungi, Lichens and Mycoplasma.
		3. The students learn the importance of Fungi, Lichens and Mycoplasma for human beings.
B. Sc. I Skill based course	SBOTSC1151 Mushroom cultivation Technique	1. Students understand mushroom cultivation technique
		2. Students understand the potential of mushroom cultivation as a source of food.
		3. Students understand the potential of mushroom cultivation as a source of self-employment.
Generic Elective	SBOTGE1151 Medicinal Plants and their Uses-II	1. Understand history, Scope and Importance of Medicinal Plants & indigenous Medicinal Sciences
		2. Describe the common medicinal plants in the neighborhood for therapeutically use.
		3. Conserve endangered and endemic medicinal plants.
		4. Efficient in modern tool use to get additional knowledge from the internet.

B. Sc. II **Semester-IV** **Major** Paper - I	SBOTCT1251 Bryophytes and Pteridophytes	1. Students understand the morphology, structure and importance Bryophytes and Pteridophytes **Taxonomy of Angiosperms**
		2. Students learn the evolutionary trends in plants and how they progressed from water to land; from gametophytes to sporophytes.
		3. Students are acquainted with development of vasculature in the plants.
Practical **Major**	SBOTCP1251 Practical Based on paper SBOTCT1251	1. Students understand the morphology, structure and importance Bryophytes and Pteridophytes
		2. Students learn the evolutionary trends in plants and how they progressed from water to land; from gametophytes to sporophytes.
		3. Students are acquainted with development of vasculature in the plants.
B. Sc. II **Major** Paper - II	SBOTCT1252 Genetics and Plant Breeding	1. Students understand heredity and variation, Mendelian genetics and gene interactions.
		2. The students understand sex-determination, linkage, sex linked inheritance and genetic variations.
		3. Students know about crop improvement methods in plant breeding.
Practical **Major**	SBOTCP1252 Practical Based on paper SBOTCT1252	1. Students understand heredity and variation, Mendelian genetics and gene interactions.
		2. The students understand sex determination, linkage, sex linked inheritance and genetic variations.
		3. Students know about crop improvement methods in plant breeding.
B. Sc. II **Minor** Paper - I	SBOTMT1251 Diversity of Phanerogams	1. Students understand the classification, morphology and anatomy of seed plants.
		2. Students learn the about process of evolution of seed plants.
		3. Students know the importance of Gymnosperms and Angiosperms for human welfare.
Practical **Minor**	SBOTMP1251 Practical Based on paper SBOTMT1251	1. Students understand the classification, morphology and anatomy seed plants
		2. Students learn the about process of evolution of seed plants.
		3. Students know the importance of Gymnosperms and Angiosperms for human welfare.
Generic Elective	SBOTGE 1251 Plants and Human Welfare-II	1. Understanding the economically important plants.
		2. Understanding the potential of plants for human welfare
		3. Understanding the role of plants in human health.
Vocational Course	SBOTVC1251 Bio-pesticide and Pest Management	1. Understanding the role of organic farming.
		2. Understanding the potential of Bio-pesticide as an alternative to chemical pesticide
		3. Role of bio-pesticide in protecting the environment and managing the waste.
B. Sc. III **Semester-VI** Paper-XIV	DSCB-II: Genetics and Plant Breeding	1. Understand Mendelian genetics, gene interaction. 2. Learn the sex determination, linkage, sex linked inheritance and genetic variations. 3. Understand various crop improvement methods in plant breeding.
B. Sc. III Paper-XV	DECB-II: Plant Pathology-II	1. The students will be able to understand fundamentals of aerobiology and seed pathology. 2. The students will be able to understand in detail the process of plant defense mechanism and management.

		3. Students will acquire knowledge of different plant diseases in different plants.
B. Sc. III Paper-XVI	DSCBP-I: Practicals based on DSCB-I & II	1. This program will train and orient the students in the field of Cell Biology, Molecular Biology, Plant Breeding
B. Sc. III Paper-XVII	DECBP-I: Practicals based on DECB-I & II	2. Students shall be able to identify different plant species, plant diseases and shall be able to do their management.
SECB- IV	SECB-IV: Mushroom Cultivation	1. This will also develop specific skills amongst students for self employability through the development of their own enterprises.

M. Sc. (Botany) Programme Outcomes	
At the end of the programme, student will be able to	
1	Understand the scope and importance of discipline.
2	Instill a love and curiosity for nature through living plants.
3	To make students open-minded and curious, we try our best to nurture and develop scientific Attitude.
4	We make students fit for society by enabling them to work hard.
5	Make the students exposed to the diverse life forms. 6. Make them skilled in practical work, experiments, laboratory equipment and to interpret correctly on biological materials and data. 7. Develop interest in Biological research. 8. Encourage students to research related topics. 9. Develop a thirst for protecting natural resources and the environment. 10. Develop the ability to use the knowledge acquired in various spheres of life to make our country self-reliant 11. Appreciate and apply ethical principles to biological science research and practice.

Programme Specific Outcomes	
At the end of the programme, student will be able	
1	Understanding the taxonomy of plants from Algae to Angiosperm. Identification of plants in field increases the basics of plants. The study of biodiversity in relation to habitat will be related to climate change, land and forest degradation and types of ecosystems. Application of Botany in agriculture is through study of plant pathology, seed technology, Trichoderma cultivation and vermicomposting.
2	Understand the ultra structure of Bacteria and Viruses, ultra structure and functions of cell, cell membranes, cell organization, communications, signaling, genetics, plant breeding, anatomy, taxonomy, ecology and plant Physiology and biochemistry.
3	Understand the multi-functionality of plant cells in the production of fine chemicals and their wide range of industrial applications.
4	Understand research skills, research methodology and research projects during this program.
5	Analyze and apply the methodologies and techniques learnt during the course of studying botany
6	Share social, environmental and ethical concerns with fellow citizens
7	The program enables the students to face NET, SET, MPSC, UPSC and other competitive examinations successfully.

M. Sc. : SEMESTER- I and III

Class &Paper	Course code & course title	At the end of the course, student will be able to
M. Sc. I Major **(Semester-I)** Paper - I	SBOTC401 Diversity of Microbes	1. Understand the morphology, structure and importance of the various organisms.
		2. Differentiate between various groups of Fungi, Bacteria, Viruses, and Lichens & Mycorrhiza.
		3. Learn the life cycles of individuals belonging to Fungi, Bacteria, Viruses, Lichens & Mycorrhiza.
Paper -II **Major**	SBOTC402 Diversity of Cryptogams	1. Understand the morphology, structure and importance of the various organisms.
		2. Differentiate between various groups of Algae, Bryophyta and Pteridophyta.
		3. Learn the life cycles of individuals belonging to Algae, Bryophyta and Pteridophyta.
Paper -III **Major**	SBOTC403 Taxonomy of Angiosperms and Gymnosperms	1. Understand the morphology, structure and importance of the various organisms.
		2. Differentiate between various groups of Gymnosperms, Angiosperms and fossil plants.
		3. Learn the characters of taxa belonging to Gymnosperms, Angiosperms and fossil plants.
Paper -IV **Elective** (DSE)	SBOTE401 Bioinstrumentation and Methods in Biology	1. Understand the actual working and applications of different laboratory equipment.
		2. Learn the various techniques used in life sciences and their utility.
Research Methodology Paper - V	SVECR401 Research Methodology	1. Develop the ability to apply the methods while working on a research project work. 2. Develop a appropriate framework for research studies.
Practical DSC Practical **Major**	SBOTP401 Lab 1 / Based on theory Paper SBOTC401	1. Understand the ultra structure of Bacteria and Viruses, ultra structure and functions of cell, cell membranes, cell organization, communications, signaling.
Practical DSC Practical **Major**	SBOTP402 Lab 1 / Based on theory Paper SBOTC402	1. Understand the morphology and anatomy of cryptogams.
Practical DSC Practical **Major**	SBOTP403 Lab 1 / Based on theory Paper SBOTC403	1. Understand the taxonomy of plants from Algae to Angiosperm. Identification of plants in field increases the basics of plants.

Diversity of Microbes
Taxonomy of Angiosperms
Lab 1 / Based on theory Paper SBOTC401
Lab 1 / Based on theory Paper SBOTC401

DSE Practical	SBOTEP401 Elective Lab/ Based on Elective Paper SBOTE401	1. The study of biodiversity in relation to habitat will be related to climate change, land and forest degradation and types of ecosystems.
M. Sc. II Semester-III Major with core practical	SBOTC501 Plant Physiology SBOTP501 Lab 1 / Based on theory Paper SBOTC501	1. Understanding the mechanism of different water-based process in plants. 2. Able to understand role of light, hormone in controlling plant activity 3. Understand important plant process i.e. photosynthesis and respiration.
Major with core practical	SBOTC502 Molecular Biology and Biostatistics SBOTP502 Lab 2/ Based on theory Paper SBOTC502	1. Detailed understanding about the nucleic acid. 2. Able to understand expression and regulation of different proteins in body 3. Understanding and interpretation of various statistical tools in biological experiments.
Major with core practical	SBOTC503 Pharmacognosy and phytochemistry SBOTP503 Lab 3/ Based on theory Paper SBOTC503	1. To understand the concepts and principles of Pharmacognosy and phytochemistry. 2. To explore various Pharmacognosy and phytochemistry techniques. 3. To analyze the environmental and economic aspects of Pharmacognosy and phytochemistry. 4. Evaluate the sustainability and scalability of Pharmacognosy practices.
Elective (DSE) with practical	SBOTE502 Fundamentals of Plant Pathology **DSE Practical** SBOTEP 502 Based on Elective Paper SBOTE502	1. The students will be able to understand the importance of plant pathology and will helps to develop interest in Plant Pathology. 2. They will bring the awareness among the farmers for losses caused due to epidemics. 3. They will adapt plant pathology as a profession to learn research and diagnostic skills. 4. Student will know importance of sign and symptoms for detection of pathogens and disease, integrated methods of disease management, use of biological and chemicals in disease management. 5. Students will know symptoms, etiology, disease cycle and management of major diseases of cereals, pulses, oil seeds and vegetables in this region.
Research Project	SBOTRP501 Research Project	1. Students learn about research techniques and they also prepare a knowledgeable project skill.
M. Sc. : SEMESTER- II and IV		
Class & Paper	**Course code & course title**	**At the end of the course, student will be able to**
M. Sc. I **Semester-II Major** with core practical	SBOTC 451 CELL BIOLOGY, GENETICS AND PLANT BREEDING SBOTP 451 Based on theory Paper SBOTC 451	1. Understand the structural organization and functions of cell and cell organelles. 2. Able to understand Gene structure, linkage groups, Genetic inheritance and extra chromosomal inheritance in plants. 3. Understand basic techniques of hybridization.
Semester-II	SBOTC 452	1. Study of origin, cultivation and economic importance of various plant wealth.

Major with core practical	PLANT RESOURCE UTILIZATION AND BIODIVERSITY CONSERVATION SBOTP 452 Based on theory Paper SBOTC 451	2. Learn the importance of biodiversity and motivation of students for its conservation
Semester-II **Major** with core practical	SBOTC 453 PLANT ANATOMY AND EMBRYOLOGY OF ANGIOSPERMS SBOTP 453 Based on theory Paper SBOTC 451	1. Understand the anatomy, embryology and palynology of angiosperms. 2. Learn the applied aspects of palynology, embryology and anatomy.
Elective with core practical	SBOTE 451 PLANT ECOLOGY, ENVIRONMENTAL BIOLOGY AND PHYTOGEOGRAPHY SBOTEP 451 Based on theory Paper SBOTE 451	1. Able to understand the ecological principles, structure and functions of ecosystem. 2. Learn about the causes of environmental pollution and its control measures. 3. Learn about different Phyto-geographic regions and their vegetation pattern.
M. Sc. II **Semester-IV** **Major** with **DSC Practical**	SBOTC551 Biochemistry and Plant Metabolism SBOTP551 Lab 1 / Based on theory Paper SBOTC551	1. Understand the biochemistry and metabolism of amino acids, proteins including enzyme kinetics. 2. Able to understand nitrogen, Sulphur and phosphorous metabolism in plant. 3. Understand role and importance of carbohydrate and lipids in plants.
Major with **DSC Practical**	SBOTC552 Biotechnology and Genetic Engineering SBOTP 552 Lab 2/ Based on theory Paper SBOTC552	1. Understand the basic principle and process of plant tissue culture. 2. Application of plant tissue culture on large scale and industrial application. 3. Understand the technique and process of cloning.
Elective (DSE) with **DSE Practical**	SBOTE552 Physiological Plant Pathology and Plant Diseases SBOTEP 552 Based on Elective Paper SBOTE552	1. The students will be realizing about physiological and molecular changes brought about in host plants. 2. Student will think how to prevent the production of enzymes and toxins of plant pathogens. 3. Students will know common plant pathogens, symptoms, etiology, disease cycle and management of major diseases of crop plants. 4. Students will know the concept post-harvest diseases of fruit & their management.
Publication Ethics	SBOTPE551 Publication Ethics	1. To have a positive disposition towards continued learning about research philosophy & ethics. 2. To know Rules, Regulations, Issues, Options, and Scientific Resources of Research Ethics. 3. To learn the culture of fairness, honesty and integrity in academic communications and to understand the purpose and value of ethical decision-making. 4. Avoid wasteful and duplicate publications & encourage original contributions to advance Academic Research and Scholarship. 5. Acquiring knowledge & professional competence and expertise about Patents, Copyrights, and other forms of Intellectual Property Rights. 6. To promote social good and prevent or mitigate societal hazards through innovative ideas, creativity and research advocacy
Research	SBOTRP1551 Research Project	1. Understand research skills, research methodology and research projects during this program.

Project		2. Analyze and apply the methodologies and techniques learnt during the course of studying. botany