KONGUNADU ARTS AND SCIENCE COLLEGE (AUTONOMOUS)
Re-accredited by NAAC with 'A+' Grade (4th Cycle)
College of Excellence (UGC) Coimbatore – 641 029

DEPARTMENT OF BOTANY

COURSE OUTCOMES (CO)

B.SC. BOTANY

For the students admitted
in the Academic Year 2022-2023

22UBO101

Programme Code: 05		B.Sc., BOTANY		
Core Paper 1: PLANT DIVERSITY – I				
Batch 2022-2023	**Semester** I	**Hours / Week** 7	**Total Hours** 105	**Credits** 5

COURSE OBJECTIVES

- To acquire knowledge on evolution of Thallophytes and to know about the diversity patterns of lower life forms on earth.
- To understand the distribution, structure, reproduction and life cycle patterns of lower life forms like algae, fungi and lichens.
- To know the economic value aspect of lower organisms.

COURSE OUTCOMES

On successful completion of the course, the students will be able to

K1 ↑ ↓ K5	CO1	Know about the distribution and mode of nutrition of algal and fungal species
	CO2	Differentiate, identify and classify the algal species using algal pigments and to study the structure, reproduction and life cycle patterns of algae.
	CO3	Gain thorough knowledge on the symbiotic nature of fungi associated with tree species and improve soil fertility
	CO4	Apply knowledge on the involvement and beneficial aspects of fungi to mankind.
	CO5	Apply their knowledge on the involvement of lichens as the indicators of pollution

22EVS101

Programme Code: 05	B.Sc., BOTANY			
	PART IV – ENVIRONMENTAL STUDIES			
Batch 2022-2023	**Semester** I	**Hours / Week** 2	**Total Hours** 30	**Credits** 2

COURSE OBJECTIVES

- The course will provide students with an understanding and appreciation of the complex interactions of man, health and the environment. It will expose students to the multi-disciplinary nature of environmental health sciences
- To inculcate knowledge and create awareness about ecological and environmental concepts, issues and solutions to environmental problems.
- To shape students into good “Ecocitizens” thereby catering to global environmental needs.
- This course is designed to study about the types of pollutants including gases, chemicals petroleum, noise, light, global warming and radiation as well as pollutant flow and recycling and principles of environmental pollution such as air, water and soil
- The course will address environmental stress and pollution, their sources in natural and workplace environments, their modes of transport and transformation, their

ecological and public health effects, and existing methods for environmental disease prevention and remediation.

COURSE OUTCOMES

On successful completion of the course, the students will be able to

K1 ↕ K5	CO 1	Understand how interactions between organisms and their environments drive the dynamics of individuals, populations, communities and ecosystems
	CO2	Develop an in depth knowledge on the interdisciplinary relationship of cultural, ethical and social aspects of global environmental issues
	CO3	Acquiring values and attitudes towards complex environmental socio-economic challenges and providing participatory role in solving current environmental problems and preventing the future ones
	CO4	To gain inherent knowledge on basic concepts of biodiversity in an ecological context and about the current threats of biodiversity
	CO5	To appraise the major concepts and terminology in the field of environmental pollutants, its interconnections and direct damage to the wildlife, in addition to human communities and ecosystems

22UBO202

Programme Code: 05		**B.Sc., BOTANY**		
Core Paper: 2 - PLANT DIVERSITY – II				
Batch **2022-2023**	**Semester** **II**	**Hours / Week** **7**	**Total Hours** **105**	**Credits** **5**

COURSE OBJECTIVES

- To know about the diversity of Cryptogams and Phanerogams.
- To understand the life cycle patterns of Bryophytes, Pteridophytes and Gymnosperms.
- To study the fossil remains of plants belonging to various eras of Palaeobotany.

COURSE OUTCOMES

On successful completion of the course, the students will be able to

K1 ↕ K5	CO1	Acquire knowledge on diversity among Bryophytes, Pteridophytes and Gymnosperms.
	CO2	Understand the internal structure and reproduction of Cryptogams and Phanerogams
	CO3	Apply the medicinal and economic aspect of Bryophytes, Pteridophytes and Gymnosperms for the benefit of human welfare.
	CO4	Implement knowledge on the structural organization and life cycle patterns of Gymnosperms
	CO5	Compare and evaluate the Cryptogamic and Phanerogamic characters along with fossil forms and their past evidences for the identification and determination of their age through radiocarbon dating.

22UBO2CL

Programme Code: 05		B.Sc., BOTANY		
Core Practical 1: PLANT DIVERSITY – I & II				
Batch	**Semester**	**Hours / Week**	**Total Hours**	**Credits**
2022-2023	**II**	**2**	**30**	**2**

COURSE OBJECTIVES

- To enable students to know about the diversity of lower organisms.
- To understand the life cycle pattern of Bacteria, Virus, Algae, Fungi, Lichens, Bryophytes, Pteridophytes, Gymnosperms and Palaeobotany.
- To study the fossil remains of plants in the division of Palaeobotany.

COURSE OUTCOMES

On successful completion of the course, the students will be able to

K3 ↕ K5	CO1	Understand the primitive and advanced nature of Thallophytes
	CO2	Appraisal of the morphological features of lower life form habitats
	CO3	Examine variations in structural organization and reproduction of Cryptogams
	CO4	Examine the internal structural organization of Cryptogams and Phanerogams
	CO5	Demonstrate the nature of occurrence and reproduction patterns of Lichens

22VED201

Programme Code: 05	B.Sc., BOTANY		
	VALUE EDUCATION - MORAL AND ETHICS		
Batch	**Hours / Week**	**Total Hours**	**Credits**
2022-2023	2	30	2

COURSE OBJECTIVES

- To impart Value Education in every walk of life.
- To help the students to reach excellence and reap success.
- To impart the right attitude by practicing self introspection.
- To portray the life and messages of Great Leaders.
- To insist the need for universal brotherhood, patience and tolerance.
- To help the students to keep them fit.
- To educate the importance of Yoga and Meditation.

COURSE OUTCOMES

After completing the course the students:

K1 ↕ K5	CO1	will be able to recognize Moral values, Ethics, contribution of leaders, Yoga and its practice
	CO2	will be able to differentiate and relate the day to day applications of Yoga and Ethics in real life situations
	CO3	can emulate the principled life of great warriors and take it forward as a message to self and the society
	CO4	will be able to Analyse the Practical outcome of practicing Moral values in real life situation
	CO5	could Evaluate and Rank the outcome of the pragmatic approach to further develop the skills

22UBO303

Programme Code : 05		**B.Sc., BOTANY**		
Core Paper 3: ANATOMY AND EMBRYOLOGY OF ANGIOSPERMS				
Batch **2022-2023**	**Semester** **III**	**Hours/Week** **5**	**Total Hours** **75**	**Credits** **4**

COURSE OBJECTIVES

- To inculcate knowledge on tissues and anatomical features of plants
- To differentiate the primary and secondary anatomical structure of dicot and monocot plants
- To understand the key aspects of reproductive systems of flowering plants

COURSE OUTCOME

On successful completion of the course, the students will be able to

K1 ↕ K5	CO1	Know about the various developmental aspects of Angiospermic plants.
	CO2	Compare and identify the structural differences existing among the vascular plants.
	CO3	Acquire knowledge on secondary growth of Angiosperms.
	CO4	Imply the embryological and anatomical knowledge to differentiate the plant taxa.
	CO5	Recognize the evolutionary studies of dicot and monocot embryo

22UGC3S1

Programme Code : 05		**B.Sc., BOTANY**		
SKILL BASED SUBJECT 1 – CYBER SECURITY				
Batch **2022-2023**	**Semester** **III**	**Hours/Week** **2**	**Total Hours** **30**	**Credits** **3**

COURSE OBJECTIVES

- The course introduces the basic concepts of Cyber Security
- To develop an ability to understand about various modes of Cyber Crimes and Preventive measures
- To understand about the Cyber Legal laws and Punishments

COURSE OUTCOME

On successful completion of the course, the students will be able to

K1 ↕ K5	CO1	To Understand the Concepts of Cybercrime and Cyber Frauds
	CO2	To Know about Cyber Terrorism and its preventive measures
	CO3	To Analyze about the Internet, Mobile Phone and E-commerce security issues
	CO4	To Understand about E-mail and Social Media Issues
	CO5	To Describe about various legal responses to Cybercrime

22UBO404

Programme Code: 05		**B.Sc., BOTANY**		
Core Paper 4: CYTOLOGY, GENETICS AND PLANT BREEDING				
Batch	**Semester**	**Hours / Week**	**Total Hours**	**Credits**
2022-2023	**IV**	**5**	**75**	**4**

COURSE OBJECTIVES

- To learn the cellular details, cell organelles and their functions
- To acquire knowledge on genes and their interactions
- To gain knowledge on plant breeding methods and crop improvement programmes

COURSE OUTCOMES

On successful completion of the course, the students will be able to

K1 ↕ K5	CO1	Understand the structural organizations of cells and their cellular mechanisms
	CO2	Understand and explain scientific principles behind nature and function of genes and their process of inheritance.
	CO3	Apply the acquired knowledge on character exchanges among the individuals due to crossing over.
	CO4	Understand the role of genetic mechanisms during evolution
	CO5	Study the techniques behind the production of superior crop varieties

22UBO4CM

Programme Code : 05		**B.Sc., Botany**		
Core Practical 2: ANATOMY, EMBRYOLOGY OF ANGIOSPERMS, CYTOLOGY, GENETICS AND PLANT BREEDING				
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2022 – 2023	**IV**	**2**	**30**	**2**

COURSE OBJECTIVES

- To learn about the special structures associated with plants
- To obtain knowledge on primary, secondary and anomalous structures of plants
- To understand and solve the biological related problems
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COURSE OUTCOME

K3 ↕ K5	CO1	Analyze various internal and external structures of the plants
	CO2	Dissect and examine different stages of embryos of *Tridax* plant
	CO3	Analyze the progress of cell division and their significance
	CO4	Understand basic principles of gene inheritance
	CO5	Demonstrate methods used in plant breeding

22UBO4S2

Programme Code: 05	B.Sc., BOTANY			
SKILL BASED SUBJECT II: PLANT TISSUE CULTURE CONCEPT AND APPLICATIONS				
Batch	**Semester**	**Hours / Week**	**Total Hours**	**Credits**
2022-2023	**IV**	**2**	**30**	**3**

COURSE OBJECTIVES

- To gain the basic knowledge on plant tissue culture and organization of tissue culture laboratory
- To acquire fundamental knowledge on tissue culture media and preparation
- To reproduce the rare endemic & endangered plants from tissue culture techniques
- To gain the theoretical knowledge on transgenic plants and their applications

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COURSE OUTCOMES (CO)

On successful completion of the course, the students will be able to

K1	CO1	Know about plant tissue culture laboratory organization
↕	CO2	Gain knowledge on various tissue culture media composition and preparation
	CO3	Learn about the direct regeneration techniques
K5	CO4	Study various tissue culture techniques and their applications
	CO5	Understand *in vitro* regenerated variants

22UBO505

Programme Code: 05	B.Sc., BOTANY			
Core Paper: 5 - FUNDAMENTALS OF COMPUTER AND BIOINFORMATICS				
Batch	**Semester**	**Hours / Week**	**Total Hours**	**Credits**
2022-2023	**V**	**4**	**60**	**4**

COURSE OBJECTIVES

- To acquire basic knowledge about computers
- To know how to create databases
- To impart knowledge on biological information's available in the databases

COURSE OUTCOMES

On successful completion of the course, the students will be able to

K1	CO1	Inherit computer knowledge and internet usage.
↕	CO2	Understand the components of computers and usage of biological databases.
	CO3	Applying technical skills to know the sequences of nucleic acids and amino acids in genes and protein molecules.
	CO4	Identify the structure of various biomolecules using biomolecular visualization techniques.
K5	CO5	Evaluate evolutionary relationships using sequence alignments.

22UBO506

Programme Code: 05		**B.Sc., BOTANY**		
Core Paper 6: TAXONOMY OF ANGIOSPERMS AND ECONOMIC BOTANY				
Batch **2022-2023**	**Semester** **V**	**Hours / Week** **5**	**Total Hours** **75**	**Credits** **5**

COURSE OBJECTIVES

- To study morphology of Angiospermic plants
- To learn the technical terms / descriptors to know the morphological features
- To recognize plant families of major flowering plants and their diagnostic features.
- To acquire basic knowledge on the principles of phylogeny and biosystematics.
- To familiarize knowledge on plants with immense economic values.

COURSE OUTCOMES

On successful completion of the course, the students will be able to

K1 ↕ K5	CO1	Understanding the systems of classification of Angiosperms, plant morphological terminologies and identifying morphological peculiarities
	CO2	Understand nomenclature principles of flowering plants and gain hands on experience on herbarium preparation techniques
	CO3	Recognize members of major Angiospermic families by identifying their diagnostic features
	CO4	Analyzing the comparative account among the families of Angiosperms
	CO5	Evaluate the economic and beneficial aspects of plants to human mankind

22UBO507

Programme Code: 05		**B.Sc., BOTANY**		
CORE PAPER 7: PLANT ECOLOGY, PHYTOGEOGRAPHY AND RESOURCE CONSERVATION				
Batch **2022-2023**	**Semester** **V**	**Hours / Week** **4**	**Total Hours** **60**	**Credits** **4**

COURSE OBJECTIVES

- To understand the principles of ecosystem.
- To acquire basic knowledge about community succession
- To ensure knowledge on resource conservation and related environmental acts

COURSE OUTCOMES

On successful completion of the course, the students will be able to

K1 ↕ K5	CO1	Pertain knowledge on principle factors controlling the environment.
	CO2	Understand the pattern of distribution of plant species in various communities and their adaptive features.
	CO3	Assess the structure and functions of various ecosystems.
	CO4	Explore knowledge on the pattern of distribution of natural resources.
	CO5	Evaluation of management practices for the sustainable utilization of natural resources.

22UBO508

Programme Code: 05	**B.Sc., BOTANY**			
Core Paper 8: MICROBIOLOGY AND PLANT PATHOLOGY				
Batch **2022-2023**	**Semester** **V**	**Hours / Week** **4**	**Total Hours** **60**	**Credits** **4**

COURSE OBJECTIVES

- To attain knowledge on major groups of microbes.
- To understand the exploitation of microbes in industries.
- To learn the different pathogenic organisms of plants causing various diseases

COURSE OUTCOMES

On successful completion of the course, the students will be able to

K1 ↕ K5	CO1	Recognize evolutionary relationships of microorganisms through various classifications
	CO2	Understand the use of microbes in industries for the welfare of mankind.
	CO3	Apply knowledge on microbial technology for the production of antibiotics.
	CO4	Knowledge on plant pathogen interactions on disease development
	CO5	Implement the plant disease management techniques under field level

22UBO5CN

Programme Code: 05	**B.Sc., BOTANY**			
Core Practical 3 - FUNDAMENTALS OF COMPUTER AND BIOINFORMATICS				
Batch **2022-2023**	**Semester** **V**	**Hours/Week** **2**	**Total Hours** **30**	**Credits** **2**

COURSE OBJECTIVES

- To insist basic knowledge on the components of computer.
- To create a document, table, chart and database using MS Office.
- To learn sequence and structure of genes and protein molecules.

COURSE OUTCOMES

On successful completion of the course, the students will be able to

K3 ↕ K5	CO1	Apply knowledge to create biological databases.
	CO2	Apply knowledge on preparation and presentation of data base
	CO3	Analyze secondary structure predictions of any protein molecules using appropriate biological software.
	CO4	Examine macromolecular structures through visualization tools.
	CO5	Evaluate pattern of phylogenetic interrelation ship among plants

22UBO5CO

Programme Code: 05	**B.Sc., BOTANY**			
Core practical 4: TAXONOMY OF ANGIOSPERMS, ECONOMIC BOTANY, PLANT ECOLOGY, PHYTOGEOGRAPHY, RESOURCE CONSERVATION, MICROBIOLOGYAND PLANT PATHOLOGY				
Batch 2022-2023	**Semester V**	**Hours/Week 4**	**Total Hours 60**	**Credits 2**

COURSE OBJECTIVES

- To learn the morphological, taxonomical and economic values of plants
- To impart knowledge on the determination of types of vegetation's using quantitative ecological characters
- To study the different types of ecosystem
- To study the cellular details, genetic constitution and plant breeding techniques.

COURSE OUTCOMES

K3 ↕ K5	CO1	Provide lab based training in writing short species descriptions and illustrations
	CO2	Apply knowledge on identification of plants and assigning their families based on diagnostic features
	CO3	Determine the distribution of vegetation's in a given habitat using various quadrat methods.
	CO4	Apply knowledge on the pattern of distribution of plants in any ecological niche
	CO5	Enhancement of microbial culture

22UBO609

Programme Code: 05	**B.Sc., BOTANY**			
Core Paper 9 – BIOCHEMISTRY AND BIOINSTRUMENTATION				
Batch 2022-2023	**Semester VI**	**Hours / Week 7**	**Total Hours 105**	**Credits 5**

COURSE OBJECTIVES

- To study the structure of atom and chemical bonds
- To learn the metabolism of chemical reactions in a cell
- To seed the basic knowledge about instruments
- To make students understand the applications of instruments and to train the students handle and maintain instruments.

COURSE OUTCOMES

On successful completion of the course, the students will be able to

K1 ↕ K5	CO1	Gain knowledge on chemical bonds, atoms and molecules.
	CO2	Understand the chemical structure of macro molecules.
	CO3	Assess the structural organization of biomolecules
	CO4	Analyze the working principles and mechanisms of instruments
	CO5	Evaluate the direct applications and benefits of instruments used for biological experiments

22UBO610

Programme Code: 05		**B.Sc., BOTANY**		
Core Paper 10: PLANT PHYSIOLOGY				
Batch 2022-2023	**Semester VI**	**Hours/Week 6**	**Total Hours 90**	**Credits 4**

COURSE OBJECTIVES

- To study about water potential and its components
- To understand the mechanism of various metabolic process in plants
- To acquire inherent knowledge on mineral nutrients, growth and development in plants

COURSE OUTCOME

On successful completion of the course, the students will be able to

K1 ↕ K5	CO1	Gain knowledge on the relationship of complementary metabolic process in energy acquisition and understand the water potential and its effects on cellular functions
	CO2	Learn about the movement of sap and absorption of water in plant body
	CO3	Assess the process of photosynthesis and respiration in higher plants with particular emphasis on aerobic and anaerobic respiration
	CO4	Analyze the physiological effects of growth regulators in plants
	CO5	Validate the biosynthetic pathways of plant growth regulators

22UBO611

Programme Code: 05		**B.Sc., BOTANY**		
Core paper 11: BIOPHYSICS AND BIOSTATISTICS				
Batch 2022-2023	**Semester VI**	**Hours / Week 6**	**Total Hours 90**	**Credits 4**

COURSE OBJECTIVES

- To understand the nature, pathways and applications of light energy.
- To learn the basic principles of biostatistics.
- To impart knowledge to solve biological problems.

COURSE OUTCOMES

On successful completion of the course, the students will be able to

K1 ↕ K5	CO1	Recognize the dual nature of light and its reactions with reference to plants.
	CO2	Understand basic concepts of radioactivity and the methods of detection.
	CO3	Impart knowledge on the tools of biostatistics.
	CO4	Analyze and solve the biological related problems using biostatistical formulae.
	CO5	Evaluate scientific findings through various statistical tools.

22UBO6CP

Programme Code: 05		**B.Sc., BOTANY**		
Core practical 5: BIOCHEMISTRY, BIOINSTRUMENTATION, PLANT PHYSIOLOGY, BIOPHYSICS AND BIOSTATISTICS				
Batch **2022-2023**	**Semester** **VI**	**Hours/Week** **4**	**Total Hours** **60**	**Credits** **2**

COURSE OBJECTIVES

- To acquire skills on handling of the instruments
- To learn principles and applications of instruments
- To provide hands-on techniques on instruments
- To learn metabolic process of the plants

COURSE OUTCOMES

On successful completion of the course, the students will be able to

K3 ↕ K5	CO1	Able to quantify the amount of macromolecules in a given sample
	CO2	Able to apply the principles in any biological experiments
	CO3	Apply indepth knowledge on instrumentation techniques and knowledge on handling and troubleshooting of instruments in any biological experiments
	CO4	Acquire basic knowledge on mechanism of various metabolic processes in plants
	CO5	Apply problem solving skills using statistical tools

22UBO6S3

Programme Code: 05		**B.Sc., BOTANY**		
SKILL BASED SUBJECT III: CULTIVATION AND MARKETING OF MEDICINAL PLANTS				
Batch **2022-2023**	**Semester** **VI**	**Hours / Week** **2**	**Total Hours** **30**	**Credits** **3**

COURSE OBJECTIVES

- To gain knowledge on scope, importance and conservation strategies of medicinal plants
- To understand the medicinal values of various parts of medicinal plants
- To understand the present scenario on marketing of medicinal plants
- To obtain basic knowledge on Intellectual property rights (IPR).

COURSE OUTCOMES

On successful completion of the course, the students will be able to

K1 ↕ K5	CO1	To know about *in situ* and *ex situ* conservation strategies for various medicinal plants.
	CO2	To gain knowledge on sustainable utilization of various herbal medicines for home remedies.
	CO3	Learn about the medicinal aspects of selected plant species
	CO4	Examine quality management, marketing and trade of medicinal plants
	CO5	Apply the principles and concepts of IPR and their applications

22UBO6Z1

Programme Code: 05	B.Sc., BOTANY			
PROJECT & VIVA – VOCE				
Batch 2022-2023	**Semester** VI	**Hours / Week** -	**Total Hours** -	**Credits** 5

COURSE OBJECTIVES

- To know the practical problems in various fields of Botany
- To understand and collect related data in the selected fields
- To apply suitable skills and solve selected problems through proper execution

COURSE OUTCOME

On successful completion of the project work, the students will be able to

K3 ↕ K5	CO1	Applying theoretical skill sets in lab oriented experiments
	CO2	Analyzing the importance of project work while collecting necessary data
	CO3	Evaluating variations between theories and experiments.
	CO4	Apply principles and concepts in research components
	CO5	Executing standard operating procedures and interpretation of appropriate results.

Programme Code: 05	B.Sc., BOTANY		
	Major Elective: 1 - FORESTRY		
Batch 2022-2023	**Hours / Week** 5	**Total Hours** 75	**Credits** 5

COURSE OBJECTIVES

- To understand the basic concepts of forest and their distribution types
- To acquire knowledge on forest resources and their utilization
- To gain knowledge on laws of conservation of forest

COURSE OUTCOMES

On successful completion of the course, the students will be able to

K1 ↕ K5	CO1	Recognize the importance of forest produce to mankind.
	CO2	Understand the economic aspects of forest and their importance to the society.
	CO3	Reclamation of wastelands with suitable tree species.
	CO4	Implement the socio - economic benefits of trees in day to day life
	CO5	Evaluate the plants used as source of food

Programme Code: 05	B.Sc., BOTANY		
	Major Elective: 2 - BIOTECHNOLOGY		
Batch 2022-2023	Hours / Week 5	Total Hours 75	Credits 5

COURSE OBJECTIVES

- To familiarize the fundamental principles of biotechnology and various tools
- To obtain knowledge on various developments and potential applications of gene cloning technology and genetic transformation and their application inplants
- To know the basic principles, knowledge and applications of bio-fertilizers, waste water treatment and biomass and bioenergy production
- To acquire inherent knowledge on the basic principles and applications of bioethics and biosafety

COURSE OUTCOMES

On successful completion of the course, the students will be able to

K1 ↕ K5	CO1	Gain the basic concepts of biotechnology and various tools
	CO2	Understand and gain knowledge on gene cloning techniques, methods of gene transfer in plants and various applications and tools in molecular biology
	CO3	Acquire knowledge and applications of microbes used for biofertilizer preparation, waste water treatments, biomass and energy production
	CO4	Analyze the principles of biosafety assessment procedures of food related products
	CO5	Evaluate the acquired biotechnological knowledge in their practical life

Programme Code: 05	B.Sc., BOTANY		
	Major Elective: 3 - FOOD SCIENCE		
Batch 2022-2023	Hours / Week 5	Total Hours 75	Credits 5

COURSE OBJECTIVES

- To know about the food groups and preparations
- To understand food processing technology and preservation methods
- To analyze and disseminate knowledge on food related issues

COURSE OUTCOMES

On successful completion of the course, the students will be able to

K1 ↕ K5	CO1	Acquire knowledge on manufacturing processes and technologies used in the production of food products
	CO2	Understand the nutritive value, process of food product development and their environmental considerations.
	CO3	Explain the functional properties of food in human nutrition.
	CO4	Develop skills in researching, analyzing and communicating food related issues.
	CO5	Assess the chemical and physiological changes during food processing techniques.

Programme Code: 05	B.Sc., BOTANY		
	Major Elective: 4 - SEED BIOLOGY		
Batch 2022-2023	Hours / Week 5	Total Hours 75	Credits 5

COURSE OBJECTIVES

- To study the structure of Angiospermic seeds
- To analyze various products produced by seeds.
- To assess and examine the germination capacity of seeds.

COURSE OUTCOMES

On successful completion of the course, the students will be able to

K1 ↕ K5	CO1	Recognize physical and chemical properties of seeds
	CO2	Understand the factors responsible for seed germination
	CO3	Apply various methods of processing of seeds for storage
	CO4	Implement knowledge to break seed dormancy and enhance plant growth
	CO5	Compare various methods of seed treatment and trace their patterns of growth in Angiospermic seeds

Programme Code: 05	B.Sc., BOTANY		
	Major Elective: 5 – PHARMACOGNOSY		
Batch 2022-2023	Hours / Week 5	Total Hours 75	Credits 5

COURSE OBJECTIVES

- To study the drug development from medicinal plants
- To understand the traditional systems of medicines like Ayurveda, Siddha & Unani
- To know the pharmacological actions of plant drugs

COURSE OUTCOME

On successful completion of the course, the students will be able to

K1 ↕ K5	CO1	Acquire knowledge on the therapeutic uses of plant drugs.
	CO2	Understand the traditional and modern systems of medicine.
	CO3	Relates physiological action of various plant drugs.
	CO4	Recognize the nature of pharmaceutical bioactive components in plant sources.
	CO5	Predict the identification and purity of natural drug source for their efficacy and safety.

Programme Code: 05	B.Sc., BOTANY		
	Major Elective 6 - HORTICULTURE		
Batch 2022-2023	Hours / Week 5	Total Hours 75	Credits 5

COURSE OBJECTIVES

- To learn about the propagation methods of horticultural crops.
- To study the various types of gardening, landscaping and their management.
- To know about commercial floriculture and their significance.

COURSE OUTCOMES

On successful completion of the course, the students will be able to

K1	CO1	Gain inherent knowledge on various horticultural practices
↕	CO2	Understand in depth knowledge on gardening techniques and their organization.
	CO3	Able to provide comprehensive account on cultivation practices and techniques of horticultural crops.
	CO4	Analyze various designs and patterns of arrangement of cut flowers.
K5	CO5	Evaluate various post-harvest handling strategies for various fruits and vegetables

Programme Code: 05	B.Sc., BOTANY		
	Major Elective 7 - MUSHROOM CULTIVATION TECHNOLOGY		
Batch 2022-2023	Hours / Week 5	Total Hours 75	Credits 5

COURSE OBJECTIVES

- To understand the importance of mushrooms
- To learn the methodology involved in mushroom cultivation
- To know the disease management in mushroom

COURSE OUTCOMES

On successful completion of the course, the students will be able to

K1	CO1	Recognize the nutritive, medicinal and food values of mushrooms.
↕	CO2	Determine suitable climate and cultivation techniques for mushrooms.
	CO3	Relate knowledge on designing of farming house for mushrooms.
	CO4	Apply knowledge on processing and storage of mushrooms for marketing.
K5	CO5	Assess the various developments in modern technologies to enhance productivity of mushrooms.

Programme Code: 05	B.Sc., BOTANY		
	Major Elective 8: MEDICOBOTANY		
Batch 2022-2023	Hours / Week 5	Total Hours 75	Credits 5

COURSE OBJECTIVES

- To learn about the traditional people and their knowledge in ethno-medicine.
- To understand the role of ethnic groups and government organizations in cultivation and conservation of plant genetic resources.
- To acquire basic knowledge on traditional systems of medicine in India.
- To study the potential natural products derived from medicinal plants.
- To know the conservation strategies for ET plants.

COURSE OUTCOMES

On successful completion of the course, the students will be able to

K1 ↕ K5	CO1	Recognize about ethnobotany and its relevance in Life Sciences.
	CO2	Understand various ethnobotanical sources and its uses.
	CO3	Implement knowledge on herbal drugs and its validation.
	CO4	Apply ethnopharmacological knowledge for the development of novel drugs.
	CO5	Develop skill set as a source of employment ability in pharmaceutical/herbal industries

22UBO1A1

Programme Code: 05	For B.Sc., ZOOLOGY			
ALLIED-1 BOTANY: 1				
Batch 2022-2023	Semester I	Hours / Week 5	Total Hours 75	Credits 4

COURSE OBJECTIVES

- To study the classification of Cryptogams & Gymnosperms.
- To learn the structure and life cycle patterns of primitive to advanced life forms.
- To impart knowledge on the economic values of plants.

COURSE OUTCOMES

On successful completion of the course, the students will be able to

K1 ↕ K5	CO1	Gain knowledge on lower life form habits, habitats and their phylogeny
	CO2	Understand structural organization and reproduction of lower life forms
	CO3	Apply impart knowledge in the identification of plant diseases and their control measures
	CO4	Explore the economic aspects of lower life forms for the betterment of mankind
	CO5	Evaluate the life cycle patterns of Cryptogams and Gymnosperms

22UBO2A2

Programme Code: 05		For B.Sc., ZOOLOGY		
ALLIED-2 BOTANY: 2				
Batch	**Semester**	**Hours / Week**	**Total Hours**	**Credits**
2022-2023	**II**	**5**	**75**	**4**

COURSE OBJECTIVES

- To differentiate the anatomical and reproductive features of monocot and dicots
- To acquire knowledge on the classification and nomenclature of Angiosperms
- To understand physiological process and metabolism in plants

COURSE OUTCOMES

On successful completion of the course, the students will be able to

K1 ↕ K5	CO1	Recognize anatomical features and morphological variations among Angiospermic taxa.
	CO2	Understand the structure and development of different types of embryos
	CO3	Apply keys and manuals for identifying any unknown plants at species level.
	CO4	Explore the nature of application of micronutrients and growth regulators for the development of plants.
	CO5	Determine the strategies for the conservation of natural resources

22UBO2AL

Programme Code: 05		For B.Sc., ZOOLOGY		
ALLIED PRACTICAL BOTANY- I & II				
Batch	**Semester**	**Hours/Week**	**Total Hours**	**Credits**
2022 – 2023	**II**	**2**	**30**	**2**

COURSE OBJECTIVES

- To acquire knowledge on the morphological and anatomical features of vascular plants.
- To create basic skills on biosystematics and herbarium preparation techniques.
- To learn the basic concepts and principles of ecosystem

COURSE OUTCOMES

On successful completion of the course, the students will be able to

K3 ↕ K5	CO1	Apply knowledge on the identification of lower life forms.
	CO2	Analyze various diseases and their impact on crop plants.
	CO3	Dissect and determine the structural organization of lower life forms.
	CO4	Assign and identify plants to their families based on their morphological characters.
	CO5	Examine the physiological process that occur in plant life.

22UHR3N1

Programme Code : 05	B.Sc., BOTANY		
	PART IV - Non- Major Elective 1 – HUMAN RIGHTS		
Batch 2022-2023	**Hours/Week 2**	**Total Hours 30**	**Credits 2**

COURSE OBJECTIVES

- To prepare for responsible citizenship with awareness of the relationship between human rights, democracy and development.
- To impart education on national and international regime on human rights.
- To sensitive students to human suffering and promotion of human life with dignity.
- To develop skills on human rights advocacy
- To appreciate the relationship between rights and duties
- To foster respect for tolerance and compassion for all living creature.

COURSE OUTCOMES

K1 ↕ K5	CO1	To understand the hidden truth of Human Rights by studying various theories.
	CO2	To acquire overall knowledge regarding Human Rights given by United Nation Commission. (UNO)
	CO3	To gain knowledge about various organs responsible for Human Rights such as National Human Rights Commission and state Human Right commission (UNHCR)
	CO4	To get habits of how to treat aged person, others and positive social responsibilities
	CO5	To treat and confirm, child, refugees and minorities with positive social justice.

22UWR4N2

Programme Code : 05	B.Sc., BOTANY			
	PART IV - NON- MAJOR ELECTIVE – II WOMEN'S RIGHTS			
Batch 2022-2023	**Semester IV**	**Hours/Week 2**	**Total Hours 30**	**Credits 2**

COURSE OBJECTIVES

- To know about the laws enacted to protect Women against violence.
- To impart awareness about the hurdles faced by Women.
- To develop a knowledge about the status of all forms of Women to access to justice.
- To create awareness about Women's rights.
- To know about laws and norms pertaining to protection of Women.
- To understand the articles which enables the Women's rights.
- To understand the Special Women Welfare laws.

- To realize how the violence against Women puts an undue burden on healthcare services.

COURSE OUTCOMES (CO)

After Completion of the Course the student will be able to

K1 ↑	CO1	Appraise the importance of Women's Studies and incorporate Women's Studies with other fields
	CO2	Analyze the realities of Women Empowerment, Portrayal of Women in Media, Development and Communication
	CO3	Interpret the laws pertaining to violence against Women and legal consequences
	CO4	Contribute to the study of the important elements in the Indian Constitution, Indian Laws for Protection of Women
↓ K5	CO5	Spell out and implement Government Developmental schemes for women and create awareness on modernization and impact of technology on Women

Programme Code : 05	**B.Sc., BOTANY** **PART IV - Non- Major Elective III – Consumer Affairs**		
Batch **2022-2023**	**Hours/Week** **2**	**Total Hours** **30**	**Credits** **2**

COURSE OBJECTIVES

- To familiarize the students with their rights and responsibilities as a consumer.
- To understand the procedure of redress of consumer complaints.
- To know more about decisions on Leading Cases by Consumer Protection Act.
- To get more knowledge about Organizational set-up under the Consumer Protection Act
- To impart awareness about the Role of Industry Regulators in Consumer Protection
- To understand Contemporary Issues in Consumer Affairs

COURSE OUTCOMES

K1	CO1	Able to know the rights and responsibility of consumers.
↑	CO2	Understand the importance and benefits of Consumer Protection Act.
	CO3	Applying the role of different agencies in establishing product and service standards.
	CO4	Analyse to handle the business firms' interface with consumers.
↓ K5	CO5	Assess Quality and Standardization of consumer affairs

22UBO5X1

Programme Code: 05		**For UG STUDENTS**		
Extra Departmental Course (EDC) - MEDICINAL BOTANY AND HUMAN WELFARE				
Batch **2022-2023**	**Semester** **V**	**Hours / Week** **2**	**Total Hours** **30**	**Credits** **3**

COURSE OBJECTIVES

- To obtain inherent knowledge on the Indian system of traditional medicine
- To expertise pharmacognostical aspects of medicinal plants
- To familiarize cultivation technologies of medicinal plants

COURSE OUTCOMES

On successful completion of the course, the students will be able to

K1 ↕ K5	CO1	Recognize crude drugs used in traditional system of medicine
	CO2	Understand the therapeutic potential of crude drugs
	CO3	Apply knowledge for the cultivation practices of medicinal plants
	CO4	Implement knowledge in identifying novel drug leads against allopathic medicine
	CO5	Assess the methods of cultivation and processing of medicinal plants